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OIL EXHAUSTION AS A
OR IN THE AGRICULTURAL
TORY OF VIRGINIA AND
MARYLAND, 1606-1860

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To

FRANCES KAZIAH CRAVEN

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PREFACE

A few studies dealing with the subject of "soil exhaustion" as a factor in history have been attempted in the European field with rather disappointing results.[1] The difficulty of securing exact data as to yields from any given unit of land over a sufficient period of time, the great variety of factors affecting the returns from the soil from year to year, and the impossibility of separating "exhaustion" as a factor in social change from the other forces at work, have rendered the task hard and the conclusions reached rather uncertain. What has been done so far, only serves to call attention to a neglected factor in history and to suggest some probable results of its influence.

The American field offers like difficulties, and the materials for any definite study are lacking. A few advantages over the European field are found in the rapidity with which virgin lands declined in producing power when first brought under cultivation, and in the fact that an abundance of new lands, ever available, made even the smallest decline in fertility an excuse for abandonment. But advantages end there and difficulties remain.

It is not the purpose of this monograph to attempt an exact measurement of the degree of soil depletion that occurred in Virginia and Maryland in the period under consideration, nor will any effort be made to measure the full effects of soil depletion upon the social order. Even today, outside the records kept for a few experimental plots at agricultural stations, it is doubtful if data for such measurements exist for the lands in any part of the nation. Climate, rainfall, harmful insects, etc., influence yields so greatly from year to year that the part which changes in the soil itself may have, cannot be separated for measurement.

Furthermore, the term "soil exhaustion" was used so loosely by the men of the past and applied to such a wide variety of conditions that any attempt at exactness is out of the question. The purpose here is only to study the general conditions surrounding agriculture in a certain period, to follow the methods employed, and, as far as possible, to note the results produced, in the light of the present day understanding of soil fertility and soil depletion. The term "soil exhaustion" will be applied as the men of the period applied it and no effort will be made at exactness. Soils thought to be exhausted and those which were largely reduced had the same social effects and a distinction need not be made.

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[1] V. G. Simkhovitch, *Toward the Understanding of Jesus;* Harriet Bradley, *The Enclosures in England, An Economic Reconstruction;* Lord Ernle, "The Enclosures of the Open Field Farms," *Journal of the Ministry of Agriculture,* December, 1920, January, 1921; see also, *Political Science Quarterly,* XXVII, 385; *Quarterly Journal of Economics,* XXXI, 173-208; *Economic Journal,* XXXII, 12.

From such a study it is hoped that the importance of this factor in the history of this region may be pointed out, and that a basis will be established from which the more important question as to why the men of this section employed destructive methods in their agriculture, may be answered. A solution to this latter problem has been sought in a rather detailed study of agricultural practices, not only in the periods of decline but also in the periods of recovery, and in an attempt to understand the circumstances under which the planters adopted and continued their methods.

The writer's obligations are many. His interest in agricultural history was awakened in the graduate classes of Professor Frederick Jackson Turner at Harvard University and centered in the Southern field under the stimulating instruction of Professor William E. Dodd at the University of Chicago. The actual beginnings of this study, however, were made under the guidance of Professor M. W. Jernegan of the University of Chicago and to him more than to any other the writer is indebted. The debt is both for material aid in the preparation of this work and for a kindly interest that gave constant inspiration.

Professor C. A. Shull of the Botany Department of the University of Chicago and Professor E. E. DeTurk of the Soils Department of the University of Illinois, have read the chapter dealing with the problems of soil fertility and soil exhaustion and have made valuable suggestions. My colleagues, Professor F. C. Dietz and Professor J. G. Randall, have read the entire manuscript and to their care and judgment I owe much. The attendants in the Library of Congress, the Pratt Library of Baltimore, the Public Library of New York City, the Virginia State Library at Richmond, the Library of the Department of Agriculture, the John Crerar Library of Chicago, and the Library of the University of Chicago, have rendered my task easier by their courteous services.

A. O. C.
URBANA, ILLINOIS
1925

CHAPTER I

SOIL FERTILITY AND SOIL EXHAUSTION

The destructive character of agricultural methods in the old tobacco regions of Virginia and Maryland has been commented on by almost every writer who has dealt with that section. From an early day the visitor to that Old South was struck with "tumble-down" conditions and returned home to tell of abandoned fields, "worn out by tobacco culture," that spread out everywhere behind the great staple as it sought the "newly-cleared ground." More harsh in condemning the system were the intelligent planters who wrought the ruin, and who, with rising debts, stoically awaited the time when the whole order "would tumble about their ears." All unite in proclaiming the system bad, and the modern investigator finds abundant evidence to support the charges of carelessness, inefficiency, and even wanton destruction.

The fact of soil exploitation has long been known, but the causes for such rapid depletion and the wide-spread and long continued use of methods that permitted it, have not been satisfactorily explained. Some have believed that tobacco is an unusually exhausting crop, quickly reducing the soils upon which it grows; others have stated that the extensive nature of tobacco cultivation made scientific and progressive methods impossible; some few have left the blame with the cultivator, and inferred, at least, that it might be attributed to the easy-going, spendthrift, short-sighted qualities supposedly developed in those who dwell in warmer climes and of which the Southern planters had more than a normal share; while still others turn to that unfailing refuge of those who are puzzled by "things Southern," and charge it to the institution of negro slavery.

There may be truth in some of these explanations, but they fail to reach the fundamental forces that were at work to produce and extend the exhaustive system and send it on, almost unchanged, into the cotton fields of a later day. They fall into error when they assume that southern practices were unique and arose from peculiarly southern characteristics and institutions. They overlook the force of markets in shaping the economic activities of frontier regions and fail to consider certain general conditions that characterize all sections where agriculture predominates. When properly understood the agricultural practices of Virginia and Maryland appear as normal developments with only such variation as geography and markets imposed. They were but one phase of the exploitation of natural resources which has characterized the occupation of our continent. The story of ruin and recovery in this section forms but a normal chapter in general agricultural history.

There are two distinct problems in the depletion of any soil. The one has to do with those factors which work immediately upon the soil to lower its yielding capacity, while the other deals with those forces which determine the use of such agricultural practices as permit destruction. The one is a problem for the scientific specialist, the other may be of interest to the student of social affairs. Physico-chemical agents deplete soils, but the degree to which these agents operate is determined largely by the crops produced and the methods of cultivation employed—things which are seldom determined by the individual cultivator but are fixed by his markets and profits. Men produce what they can sell and, in the long run, use those methods which yield them the greatest returns. The two problems are entirely different in kind, yet they deal with forces that are so closely linked together as direct agents and conditioning factors that they cannot be entirely separated. The historian who would fairly place the blame for "soil exhaustion" in any region must first have some understanding of the direct agents which work the ruin and of those conditions which determine the intensity of their activity.[1]

[1] The failure to realize the dual nature of the problem by those who have written on this subject has produced so much confusion that the term "soil exhaustion" has become almost useless. The exactness of the scientist has made him a little impatient of the loose terminology employed by the layman who speaks of any depletion as "exhaustion." Yet something might be said for the layman. The terms "soil fertility" and "soil exhaustion" are at best only relative terms. Soils are fertile or infertile only by comparison and in relation to particular plants and to particular methods of cultivation. A soil may be fertile to one plant and not to another or it may be fertile under one type of cultivation and not under another. Every soil under proper cultivation is probably capable of producing some plant or plants in more or less abundance. But in practical agriculture, "a fertile soil" is one which will profitably produce, under the existing agricultural methods and in competition with other available soils, the limited number of plants desired by a given group of men. On the other hand, a soil that will not meet these requirements will be declared "infertile" and if cultivation has reduced it to the point

Soils serve plants in a four-fold way—as a mechanical support, giving room for the development and spread of roots; as a medium through which oxygen and water are admitted and retained for future use; by furnishing substances to the soil solution from which the plants secure a part of their food materials; and by harboring numerous micro-organisms which assist the plants in making a healthy growth.[2] Other classifications might be offered but the essential facts are that the growth of plants is profoundly affected by the condition of the growing medium as to root room, water and air supply, temperature, supply of nutrients, the presence of favorable organisms and the absence of harmful factors.[3]

It will be noted that a part of these services depends upon the chemical composition of the soil particles, but that the larger part has to do with their mechanical arrangement and other outside conditions. Soils are not "mere casual mixtures of particles, but these are mingled in what amounts to almost a loose state of combination," and intermingled with organic and living substances.[4] The old idea that a soil's fertility is measured by the sum of the chemical properties of its various constituents has given way to a new dynamic conception which takes into consideration the "condition of soil in respect to compound particles and their colloidal properties; the mass and condition of organic matter in the soil; the micro-organic population . . .; and lastly a number of conditions that are unfavorable to plants by reason of some toxic action on the plant itself or on some of the bacteria essential to the plant as mediators between the crude materials of soil and the substances that can actually be used by the plant in the manufacture of food."[5] The importance of the

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where it must be abandoned, then it will be declared "exhausted." Exhaustion, in common parlance, implies no absolute condition. It only means that lands, once cultivated, no longer profitably yield the crops desired by the methods of cultivation used, and that a sufficient quantity of available land continues to do so. See A. P. Usher, "Soil Fertility, Soil Exhaustion, and their Historical Significance," *Quarterly Journal of Economics*, XXXVII, 385-411; R. S. Lennard, "The Alleged Exhaustion of the Soil of Medieval England," *Economic Journal*, XXXII, 12 *et seq.*

[2] T. L. Lyon, *Soils and Fertilizers*, p. 1.

[3] E. J. Russell, *Soil Conditions and Plant Growth*, pp. 55, 56.

[4] *Ibid.*, p. 170.

[5] A. P. Usher, "Soil Fertility, Soil Exhaustion, and their Historical Significance," *The Quarterly Journal of Economics*, XXXVII (May, 1923), 385-411.

physical condition of the soil, therefore, grows larger in importance in the newer view and greater emphasis is placed upon this as a means to fertility than upon the mere chemical composition of soil particles.[6] And to a corresponding degree the cultivator and his methods stand out as determining factors in the problem of soil fertility.

Yet the chemical composition of the soil is of vital importance. The plant draws a portion of its food materials from the soil particles and growth depends upon the presence of certain essential elements. It was at one time supposed that fertility was a matter of the quantity of these essentials, but it is now known that it does not depend upon or vary proportionally with the quantity, but depends rather upon the nutrient-supplying power of the soil and the ability of the plant to make use of the nutrients offered. The plant does not live directly upon the "inert mineral matter" of the soil, but upon "the colloidal complex of organic and inorganic compounds, usually more or less saturated with water that envelops the mineral particles."[7] The nutrient materials from the soil probably enter the plant in solution—the soil particles losing only a trifling amount to the solution—and this forms at least the minimum supply of food for the plant.[8] The solubility of the soil particles, therefore, to a great degree determines their availability, and this in turn varies greatly with the mechanical condition of the soil as to tilth, drainage, and the presence of organic matter. It is, therefore, not surprising that Russell notes that "some of the most fertile soils in England are not particularly rich in plant nutrients" but are, nevertheless, able to keep the roots well supplied,[9] or that it has been found that a change in mechanical composition of soils will often add to their fertility even though the proportion of nutrients is greatly lowered by the change.[10]

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[6] Conversation with Mr. Milton Whitney, Chief of Division of Soils, United States Department of Agriculture, July, 1923. See also, *Bulletin No. 57, United States Bureau of Soils.*

[7] E. J. Russell, *Soil Conditions and Plant Growth*, p. 239.

[8] *Ibid.*, p. 233.

[9] *Ibid.*, p. 239.

[10] T. L. Lyon, *Soils and Fertilizers*, pp. 94, 95.

In this connection the effects of calcium carbonate should be noticed. The fertility of lands rich in limestone debris has become almost proverbial, while the use of lime in the treatment of so-called "sour-soils" is a practice of

As the understanding of fertility has changed so has that of soil depletion. The old static idea, i.e., that soils contain a fixed amount of plant food materials, a part of which is removed by the growth of every plant until the supply has been entirely spent, has of course given way before the newer dynamic conception of fertility. The widening of the list of factors which influence fertility has also added to those which may play a part in soil deterioration. And here, too, the emphasis is placed to a greater degree upon the methods of cultivation employed in the preparation of the soil and the production of crops. "It is not the crops that exhaust the land," says Russell, "but the cultivation."[11] A virgin land covered with its native vegetation appears to change very little and very slowly in composition, but when cultivation begins, the soil covering being broken and crops removed, then losses follow, rapidly at first, but more slowly thereafter until a more or less constant level seems to be reached.[12]

Different classifications can be made of the direct factors in the work of reducing soils but for our purposes the following is

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long standing. The reasons for the beneficial effects of calcium carbonate, however, are not entirely understood. It seems that certain toxic substances may be thrown out of action by its presence, or that clay becomes deflocculated and unsuited for plant growth in its absence. But whatever the effect upon the soil itself, it is certain that the presence of calcium carbonate has an effect upon the plant itself, and makes physiologically available to it other indispensable nutrients which could not otherwise be used. It becomes, therefore, an important factor in fertility. E. J. Russell, *Soil Conditions and Plant Growth*, pp. 117-18; Rodney H. True, in *Science* (new series), LV (January 6, 1922), No. 1410.

[11] E. J. Russell, *The Fertility of the Soil*, pp. 47, 48. For a discussion of the older ideas of fertility and depletion, see C. G. Hopkins, *Soil Fertility and Permanent Agriculture*, pp. 300-342.

[12] *Ibid.*, pp. 43-48. The length of natural fertility under cultivation will vary, of course, with the type of soil, crops produced, methods used, etc., but experience furnishes some data for certain sections. In the long-leaf pine uplands of the cotton states where corn is raised continually, the yields range from twenty-five bushels per acre the first year to ten or less the third year; where short-leaved pine is intermingled with the long, production of goodly crops holds out for from five to seven years; and if oak and hickory are added, crops may be counted on for a period of as high as twelve years. E. W. Hilgard, *Soils, their Formation, Properties, Composition, and Relation to Climate and Plant Growth*, p. 314.

In the tobacco region of the South, as we shall see, the planters seldom counted on a paying fertility lasting more than three or four years.

sufficient—(1) the loss of materials by the growth and removal of plants; (2) erosion and leaching by rainfall; (3) the development of harmful toxins, fungi, or diseases within the soil. Some crops draw more heavily upon the soil materials than others and where no return in offal or fertilizers is made, rapid depletion follows. Improper plowing, draining, or cultivation may increase the force of erosion and leaching or develop toxicity in the soil. Lack of proper crop rotation may introduce fungi or diseases into the soil or a combination of factors unite to place the soil in such a condition that its producing power is lowered. The point is that cultivation opens the way for deterioration.[13]

The first of the direct agents—the loss of materials by plant growth—is no longer considered the absolute factor which it was at one time supposed to be. Yet the removal of organic matter, calcium carbonate, phosphates, nitrogen compounds, etc., is a factor in producing at least temporary impoverishment. Crops remove these in sufficiently large quantities to affect their availability, and unless replaced in some form, yields are affected.[14]

A second factor more serious than the first is found in the damage done by rainfall. The loss comes not only from the actual carrying away of soil particles in suspension [erosion], but also by the removal of materials in solution [leaching]. The danger is greatest on hilly lands but any soil under cultivation is subject to more or less loss. It is estimated that fifty per cent of the tillable lands in Wisconsin,[15] and seventeen per cent of those of Illinois,[16] states that are far from mountainous, are subject to detrimental erosion of economic importance. Washing is not serious while lands are forested, and streams issuing from the woodland bear little sediment, but when the trees are cut and the surface disturbed, then losses begin.

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[13] The biologist divides the factors into edaphic, climatic, and biotic.

[14] E. J. Russell, *Soil Conditions and Plant Growth*, pp. 196-98. The following table will show the quantity of primary plant food materials removed by certain common grains:-

Crop	Yield	N	K_2O	Ca O	P_2O_5	SO_2
Wheat	30 bu.	48 lb.	28.8 lb.	9.2 lb.	21.1 lb.	15.7 lb.
Oats	45 bu.	55 lb.	56.1 lb.	11.6 lb.	19.4 lb.	19.7 lb.
Corn	30 bu.	43 lb.	36.3 lb.	......	18 lb.	12 lb.

R. Warington, *Chemistry of the Farm*, pp. 64, 65.

[15] Whitson and Dunnewald, *Wisconsin Agricultural Experiment Station Bulletin Number 272* (August, 1916).

[16] Mosier and Gustavson, *Soil Physics and Management*.

It has been stated that the amount of good soil passing to the sea from the United States annually by these processes exceeds by more than two times the total amount of material removed in digging the Panama Canal.[17] In the Upland South alone, more than 5,000,000 acres of land, once cultivated, are now idle because of erosion, and it is estimated that fully 50,000,000 tons of the most fertile soil of the region are annually carried away.[18] The United States Geological Survey estimates the amount of silt carried by the Hudson River at 240,000 tons per year; by the Susquehanna, at the same; by the Savannah, at 1,000,000 tons; by the Tennessee, at 11,000,000 tons; by the Missouri, above Ruegy, at 176,000,000 tons; and by the Mississippi, at from 370,000,000 to 680,000,000 tons.[19] The National Conservation Congress of 1909 reported nearly 11,000,000 acres of abandoned land in the United States, most of which was damaged and over one-third of which was actually destroyed by erosion.[20]

The materials carried ~~away in solution by the~~ drainage waters constitute a further serious loss. Potassium, phosphorus, calcium, magnesium, sulfur, etc., in various forms, are dissolved by the rainfall and pass off into the streams. Nitrogen also washes out badly, being available as plant food material largely as a nitrate in which form it is seldom fixed in the soil.[21] Analysis of water taken from various streams shows that the Ohio River annually carries 11,144,151 tons of these five elements in solution, causing a loss at current market prices of $423,215,058. The Mississippi River carries 36,678,323 tons, worth $1,651,873,266 which, added to the losses from materials carried in suspension, gives a grand total of $4,618,088,779— an amount greater than the total value of the corn crop of the United States in 1917.[22] Calcium carbonate is especially subject to leaching, being quickly changed into soluble bicarbonate in which form it constitutes the largest single element removed. The Ohio carries annually 6,752,222 tons; the Mississippi, 22,446,379 tons; while the estimates for England and Wales place their losses at over 500 pounds for every acre of soil.[23]

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[17] R. O. E. Davis, *Yearbook of Department of Agriculture*, 1913, p. 212.

[18] W. W. Ashe, in *Review of Reviews*, XXXIX, 439-43 (1909).

[19] Quoted by R. O. E. Davis, *op. cit.*, p. 212. See also *Bulletin of the United States Department of Agriculture, No. 180.*

[20] Report of the National Conservation Congress, *Senate Document No. 676*, 60th Cong., 2d. sess. See also, L. C. Glenn, "Denudation and Erosion in the Southern Appalachian Region and the Monongahela Basin," *United States Geological Survey, Professional Paper No. 72* (1911); *United States Department of Agriculture, Bureau of Soils Bulletin No. 71.*

[21] E. B. Vorhees, *Fertilizers*, pp. 1-20.

[22] J. S. McHargue and A. M. Peter, *Kentucky Agricultural Experiment Station Bulletin No. 237.*

The question of soil toxicity is one about which there has been, and still is, considerable dispute.[24] The theory that plant roots excrete substances that are harmful to the growth of the same plants or to their near relatives, but not to other plants, was early set forth by DeCandolle. Often disputed, it has been revived by Whitney and Cameron and their associates in the United States Bureau of Soils and, in a modified form, has gained acceptance as one of the forces at work to require the rotation of crops for continued fertility.[25] The present position on the subject, as stated by Russell, is that while most of the elements essential to plants may, under certain conditions, produce a toxic effect, "there is no evidence of the presence of soluble toxins in normally aerated soils sufficiently supplied with plant food and with calcium carbonate, but that toxins may occur in 'sour soils' badly aerated and lacking in calcium carbonate or in other exhausted soils. . . ."[26] The conclusion seems to be, therefore, that where drainage is poor, plowing insufficient, or the addition of organic matter neglected, soils may become toxic under continued planting and deterioration result from this cause.

The relation of soil fungi, protozoa, bacteria and other microorganisms to soil fertility and exhaustion is a matter of growing recognition. Our knowledge of this complex life and its work, either favorable or harmful to plant growth, is as yet decidedly limited. Some of the numerous soil inhabitants in their search for food, decompose an excess of protein and leave it for the growing plant;[27] others alter the physical condition of the soil favorably to the plant, while others decompose toxins which, if allowed to accumulate, would be decidedly harmful. But not all are friendly. Soil fungi, root rots, wilts, etc., are often injurious to such crops as corn, cotton, flax, and tobacco. Some seem to interfere with the work of favorable bacteria and thus do harm—soil protozoa in particular working in this way to lower the productivity of the soil. Much is yet to be learned along this line but enough is known to justify the inclusion of these factors among the important agents of depletion.

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[23] E. B. Vorhees, *op. cit.*

[24] *Journal of American Society of Agronomy*, August, 1923.

[25] R. W. Thatcher, "The Effect of one Crop on Another," *Journal of the American Society of Agronomy*, August, 1923, pp. 331-37; Jehill Davidson, "A Comparative Study of the Effect of Cumarin and Vanillin on Wheat Grown in Soil, Sand, and Water Cultures," *Journal of the American Society of Agronomy*, VII (July, 1915), No. 2, 3; *United States Bureau of Soils Bulletin No. 28*, 1895; *No. 40*, (1907).

[26] E. J. Russell, *Soil Conditions and Plant Growth*, pp. 150-53.

These are, in general, the factors which work directly in lowering the yielding power of soils under cultivation. Their effects vary with physical conditions and methods employed, yet they present a constant menace to the fertility of any soil under cultivation and especially those whose crops and methods are ill fitted to their needs. But every soil that is tended is threatened. The farmer who would escape must be ever alert and intelligent and the social order must enable him to take such a course as will give protection.

The newer understanding of fertility and exhaustion, placing greater emphasis upon the factors which are to a degree under the control of the cultivator, adds importance to the second problem in depletion, i.e., why men employ methods which permit of ruin. And here we face not only the individual but also social conditions of which the individual is often the victim. The crops produced and the methods employed, as has been said, are seldom matters of intelligent choosing on the part of the planter. Men may, because of ignorance or habit, ruin their soils, but more often economic or social conditions, entirely outside their control, lead or force them to a treatment of their lands that can end only in ruin. Some men may be less favorably placed than others in the matter of soils, topography, rainfall, etc., and thereby face a more serious and a more constant threat, yet in most cases where practices are uniformly bad, the forces which produce them are of a social nature and appear often enough and universally enough to permit of some general classification.

Frontier communities are, by their very nature, notorious exhausters of their soils. The wants and standards of living of such communities have been developed in older economic regions and they make demands upon the newer sections that cannot be met from normal returns. The first efforts must be spent in producing the things with which to satisfy the primal wants and until exchange can be developed with older economic regions the material standards of life will be set by the natural resources of their immediate surroundings. An early period of simplicity and even lack of comforts may develop a new standard of living, but there will be also a decided effort to create a surplus and find a staple of some kind for that exchange which will widen the field of supply and lift the standard of living set by the available materials. Such exchange, when developed, can seldom be on equal terms and the surplus produced must come from an extravagant spending of the natural resources of the newer community. Seeming abundance of raw materials encourages waste; the lack of capital forbids the economies of production, and the heavier burdens of carriage and marketing fall upon the producer of the raw materials in exchange. The greater the trade, therefore, and the wider the new life which rises upon this exchange, the greater the demands upon the resources of the region until partial exhaustion limits the class who may enjoy the new imports or time brings the home production of things desired.

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[27] E. J. Russell, *op. cit.*, pp. 252, 253, 294.

All the natural resources of frontiers suffer from such pressure, and the soils are no exception. Less spectacular than furs, precious metals, or timber, they, nevertheless, are more universal and are called upon more often to bear the burden of frontier production than any other single agent. The frontier farmer, where a long continued isolation does not force a shiftless self-sufficing life, always struggles to create an agricultural surplus and find a way to market with it. Where he is fortunate enough to find some staple, the demand for which is constant, and the value of which is great enough to pay the burdens of transportation, a single-crop type of agriculture developes and long persists. The one crop with highest value in outside exchange, drives all other major crops from the fields and becomes the object of first endeavor. Early advantages give it a magnified value and habit fixes it as the dominant product of the region long after its first advantages have ceased.

Furthermore, the abundance of land, combined with a scarcity of capital and labor—a condition which characterizes all frontiers—

throws the burden of intensified production upon the soil as the cheapest factor. Only the most fertile soils will be used and only those methods employed which give greatest immediate returns regardless of future consequences. The problem is one of rapid spending, not of conservation. The speed with which the privations of the frontier may be passed, depends upon the rapidity with which the riches of the soil may be exploited. The section is most fortunate whose fertility may be most easily spent, and its progress toward a complex life will be most rapid.

This process of exploitation has gone on from one end of our land to the other, and from the earliest times down to the days of the "last American frontier." What sugar production was to the West Indies,[28] tobacco to Virginia and Maryland, cotton to the Lower South,[29] corn to the Mississippi Valley, wheat and flax have been to the Northwest of our own day.[30] And the social order has invariably reached the highest degree of complexity in the shortest period of time where the soils have been spent with the freest hand. If Virginia society early became like that of old England, it was because the people found the means of exploiting their soils; if Massachusetts failed to approximate that standard, too much emphasis should not be placed on Puritan origins. "The American planters and farmers," declared a British traveler through New England in 1775, "are the greatest slovens in Christendom," and then added significantly, "their eyes are fixed upon the present gain, and they are blind to futurity."[31] Seventy-five years later the Wisconsin farmer, who grew wheat crop after wheat crop on his weakening lands, confessed himself a "sloven farmer" but pleaded the necessities of exchange conditions as his excuse.[32] And it is well to remember that the exhausted and abandoned lands behind the advancing frontier were but a counterpart to the mineral waste and charred stumps in the train of the exploiter of mineral wealth or of virgin forest. Frontiers, like those who come to sudden wealth, are inclined to be spendthrifts.

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[28] F. W. Pitman, *The Development of the British West Indies*, pp. 62, 98, 99. "A general exhaustion of the soil had been reached as early, at least, as 1689, ..." (Barbadoes). "In Barbadoes it had been reported that there was no uncultivated land in 1724 and eleven years later the Board of Trade represented to the House of Lords that the soil there, as well as in some of the other islands, was almost worn out." Jan. 14, 1734-35, C. O. 324 No. 12, (quoted in J. T. Adams, *Revolutionary New England*, p. 150). "According to the present method. . . they plant as long as Grounds will bear without Husbandry, then leave them in a poor Condition, and proceed to take up Fresh Grounds. . . ." (Leeward Islands), Pitman, *op. cit.*, pp., 99-100; *Considerations which may tend to promote the Settlement of our new West India Colonies*, p. 37.

[29] F. L. Olmsted, *Texas Journey*, pp. 55-56. He reports more land turned to "old fields" than were in cultivation in parts of Louisiana.

[30] E. D. Ross, "How Dairying Came to North Dakota," *College and State*, North Dakota Agricultural College, VI (October, 1922), No. 1.

[31] *American Husbandry*, pp. 145, 148.

Another social force in producing exhausting methods may come from the action of governments. The demands which they make for revenue, or their action in regulating production in the interests of certain groups, may place such burdens upon the agriculturist as to force the use of depleting methods. Crops unsuited to the soils may be encouraged or demanded and their continued and exclusive production prevent a rotation of crops or an adjustment of the agriculture to the peculiar needs of the region. Duties or marketing restrictions may limit profits and prevent the use of fertilizers or tools by which the soils might be preserved. The result of any or all these things will be a burden placed upon the soil, continuing even in the face of a knowledge of better methods and a realization of impending disaster.

Such government action was particularly common in the seventeenth and eighteenth centuries when "nation-building" was supposed to depend upon the development of a self-sufficing political unit, the securing of favorable balances of trade, and upon the accumulation of a store of precious metals. Colonies in particular suffered. The conception of a colony as a permanent agricultural region to furnish raw materials, revenue, and markets to the mother country, led to a wide regulation of crops and methods in those far-flung corners of Empire, and aided in the establishment of agricultural practices which worked destruction to the soils. Mercantilism came to an end in time but protective tariffs, carried forward in the interests of certain economic activities, had a share in fixing agricultural prices and determining agricultural methods in the years which followed. The farmer has seldom been free from the effects of government action.

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[32] B. H. Hibbard, *The History of Agriculture in Dane County, Wisconsin*, pp. 125-131; J. G. Thompson, *The Rise and Decline of the Wheat Growing Industry in Wisconsin*, pp. 20-23. In fact the story of frontier wheat growing from the eastern part of the country to the west is one of constant exploitation. See story of wheat in New York, *Cultivator*, I, 19-20; II, 26; III, 250; X, 136; J. F. W. Johnston, *Notes on North America*, I, 163, 172, 184, 355; *Albany Ploughboy*, III, 38; *New York State Agricultural Society Transactions*, 1844, pp. 141-46; 1841, p.136; 1845, p. 447; 1851, p. 685; *Genessee Farmer*, VI, 108.

The third factor, markets and marketing agencies, while of particular importance on the frontier, as has been shown, is not confined in its influence to such regions. Markets may demand certain commodities at certain general prices and by the limitations which they impose, shape the type of produce raised and methods employed, regardless of the well being or general fitness of the producing region. The Virginia planter, filling the streets of his first town with the "filthy weed," to the neglect of even a safe food supply, the New England farmer depleting his breeding stock of Naragansett pacers in order to satisfy the West Indian demands,[33] are but examples that might be duplicated in other places and at other times. The costs incident to marketing may eat away profits to such an extent as to allow only destructive methods. The almost universal complaint against the middle-man of all times and places, evidences the fact that he adds a burden to those already heaped upon the producer. Markets fixed by law, determined by physical conditions, or controlled by agreement among the distributing agents, may become as burdensome as those which are far removed or cut off by physical barriers. In fact, a large part of the agricultural history of any region may be written in terms of its markets and the marketing agencies used. And the agricultural practices in vogue will in most cases be but a reflection of the degree to which these things are satisfactory.

Two last factors, more individual than social, yet gaining strength through a wide-spread existence, should be noted. The forces of ignorance and habit need little comment, though they seem to exert a peculiar power in the agricultural field. The spread of knowledge and the acceptance in practice of new ways is invariably slow among those who till the soil. Perhaps it is the failure of earlier panaceas, of which the farmer has been offered more than his share, that has made him a little wary of new things, but whatever the cause, the fact remains that crops unsuited to the soils, poor tools, and destructive methods are continued long after profits have ceased and the outside forces which compelled them in the beginning no longer operate.[34] Avoidable soil depletion has resulted often from no other outside cause than the habitual continuation of practices, once profitable, but which in the present bring only losses and place heavy burdens upon the soil. And the cause has as often been the stubborn refusal to adopt new ways already proven superior, as it has been an ignorance of better ways.

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[33] Dean Phillips, *Horse Raising in Colonial New England* (*Cornell University Agricultural Experiment Station Memoir 54*), May, 1922.

Such are the more important influences working from without to introduce and carry forward the use of agricultural practices which give wide play to the direct agents of soil depletion. Under their pressure, single crop production, poor plowing and draining, neglect of organic matter and fertilizers, and other harmful conditions have predominated and "soil exhaustion" resulted. Few periods in our history have seen the farmer free from the influence of one or more of these forces and able, unhampered, to adjust his methods to the task of preserving his soils.

The agricultural life of Virginia and Maryland, from earliest colonial days well down to the eve of the Civil War, was carried on under conditions which gave wide play to the destructive forces of depletion. Physical surroundings were unusually favorable to the direct forces of "exhaustion"; their economic life was begun under frontier conditions; markets and government regulations kept the life primarily agricultural and fixed habits that could not be easily shaken; low profits limited improvements, and a whole life was erected upon an exploitive agriculture, that had to be greatly changed before the economic effort which supported it could be altered. "Soil exhaustion" and tobacco cultivation went hand in hand.

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[34] In one sense there is a distinct "agricultural mind" which is strikingly like that of the frontier. An agricultural life separates people, brings them in close contact with a "willful" nature, and sets them at an economic task more or less primitive. The farmer is, as a rule, an individualist, and like all such, he is prone to hold to those things which experience has once proven good. Like the frontiersman, he is a conservative with that strange tendency to innovation which characterizes the man whose life ever forces him to be a "jack of all trades."

CHAPTER II

THE COLONIAL PERIOD, 1606-1783

Agriculture is fundamentally conditioned by geographic and climatic conditions. Soils, topography, rainfall, etc., not only influence crops but methods as well, and determine to a large extent the nature and intensity of the threat which the direct agents of soil depletion carry. They form a more or less permanent background upon which the agricultural life moves and they give a peculiar development to each section because of their differences. Their influence in the section under consideration was always marked.

Virginia and Maryland are part of a geographic unit that may be roughly divided into three distinct physical sections:—the Coastal Plain, the Piedmont Plateau, and the Appalachian mountainous region.[1]

The Coastal Plain stretches from the water's edge back to the head of navigation where the older crystalline rocks of the Piedmont break sharply to form a fall line in the rivers, and the flat plains give way to the rolling uplands. It seldom rises over a hundred feet above the sea level and is cut everywhere with bays and inlets, and intersected by broad parallel rivers. The soils have been transported largely from the regions above the fall line and vary greatly in their composition and texture, ranging from pure sand to a sandy loam with occasional areas of silt and clay.[2] The deep surface soils of the valleys thin out toward the higher ridges where an almost sterile subsoil rises to the surface or is to be found at a depth of only a few inches.[3] Here and there throughout the plain, beds of fossil remains of the Cenozoic and Mesozoic eras are to be found in the shape of the so called "marl beds," giving a generous supply of calcium carbonate, while near the coast stretches of swamp lands invite drainage and offer large quantities of rich mucks.

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[1] J. W. Powell, *Physiographic Regions of the United States*, pp. 73-80.

[2] W. E. Ellett and H. H. Hill, *Chemical Studies of Virginia Soils* (*Virginia Polytechnic Institute Agricultural Experiment Station Bulletin No. 200*), Dec., 1912; *Maryland Soil Survey, Field Operations of the Division of Soils*, 1900, pp. 103-124, 125, 174; also *Survey for 1901*, pp. 44-49; *The South in the Building of the Nation*, V, 3-7.

[3] *Henry's Map of Virginia* (*William and Mary College Quarterly*, XIV, 856); P. A. Bruce, *Economic History of Virginia in the 17th Century*, I, 76-77.

✓ The Piedmont Plateau reaches from the fall line on the east to the uncertain border of the Appalachian Mountains on the west. Not more than 30 to 60 miles in width in Maryland, it spreads out across Virginia to a width of some 175 miles at the point where it crosses the North Carolina border.[4] It is a region of variable topography and presents a broad plain-like surface with rolling uplands everywhere cut by narrow river valleys—a lay of land that is particularly subjected to destructive washing even under moderate rainfall.[5]

The soils of the region are residual, varying with the underlying rocks and the quantity of humus they contain, but on the whole supplying an abundance of plant food materials. The rocks of the region as a rule are high in potash-bearing minerals and a large amount of iron oxide gives a characteristic reddish hue to the soils in many parts. The fertility is of good average, lower than that of the coastal valleys, but well suited under proper cultivation to the requirements of general farming.[6]

✓ The Appalachian region consists of a line of parallel mountain ridges rising in height to the westward and interspersed with great valleys that open far up into Pennsylvania. In Virginia the region might be further divided into the Blue Ridge, the Great Valley, and the Alleghany Mountains proper, with no sharp division on the east where the Piedmont ridges rise gradually into foothills.

The soils of the Blue Ridge and the Maryland region just north of it, are clay-loams and sandy-loams and closely resemble those of the Piedmont into which they blend. The Valley soils are of all types and a great belt of limestone cuts through it, giving to the loam and clay-loam soils an abundant addition of calcium carbonate debris. It forms a region of high fertility and one well adapted to general farming and grazing. Farther west, the mountain ridges rise and the valleys narrow, presenting more limited and less favorable conditions of soil for agriculture but compensating with stores of mineral wealth.

Originally the larger part of both states was heavily forested and had to be cleared before cultivation could take place—a task so slow and difficult that much of the region was always in timber. Trees grew rapidly and when cultivated lands were abandoned, the forest returned again in a period of a few years. Travelers passing through what appeared to be virgin forest were often surprised to discover the scars of former cultivation and to learn that they were crossing what some twenty years earlier was a tobacco field. Such conditions added much to the problem of labor but afforded some compensation in the form of protection to neglected soils against washing and in the addition of organic materials in the form of falling leaves.

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[4] W. E. Ellett and H. H. Hill, *op. cit.*

[5] *Field Operations of the Bureau of Soils*, 1901, pp. 53, 257, 260.

[6] *Ibid.*, p. 257; *10th Census* (U. S.), III, 196.

Both Virginia and Maryland are subject to heavy rainfall. The annual precipitation, varying somewhat in different parts, ranges from forty to seventy inches, a third of which comes in concentrated showers during the summer months when cultivation is in progress.[7] This concentrated character of the summer rainfall—as much as fifteen inches having been known to fall in the course of three days—gives a heavy run-off from the lands and a correspondingly extreme range to the discharge of the rivers.[8] It is estimated that fifty-three per cent of the total rainfall of the Potomac River basin reaches the sea and the discharge of the river ranges from 900 feet per second at low level to over 219,000 feet per second at flood tide.[9] The Shenandoah ranges in discharge from only 380 feet per second to 140,000 feet in flood; the James, from 600 feet to 97,800; and every stream in the section is subjected to sudden and destructive freshets. The great storms of 1667 and 1685 sent the rivers into floods that rose from thirty to forty feet in a short space of time and swept destruction throughout their courses.[10] In 1771, the James, Rappahannock, and Roanoke Rivers were all reported to have suddenly risen "forty feet perpendicular above the common level" and freshets of somewhat

[7] W. W. Ashe, in *Review of Reviews*, XXXIX, 439-43; N. C. Grover and R. H. Bolster, "Hydrography of Virginia," *Geological Survey of Virginia*, pp. 7-8.

[8] R. O. E. Davis, "Soil Erosion in the South," *Bulletin United States Department of Agriculture*, p. 8. If two inches of rain falls in twenty-four hours most of it will be absorbed but if the same comes in one or two hours, little will be absorbed.

[9] *Ibid.*; *United States Geological Survey, Water Supply and Irrigation Papers, No. 203.*

[10] P. A. Bruce, *Economic History of Virginia in the 17th Century*, I, 394.

less violent nature were common occurrences.[11] In 1790, Jefferson tells of "such rains as never came . . . since Noah's flood," and declares that "clear profits will not repay the damage done to the lands."[12]

Under most favorable conditions such rainfall would produce a degree of erosion, but where the lands are rolling and broken, and the soils made up of loams, silts, and clay loams, as in many parts of this region, the losses become serious.[13] In addition, the warmer climate makes the nitrifying and oxidizing capacity of the soil high, thus preventing the formation of a sod in the fall that will resist washing. Under these conditions the alternate freezing and melting of the surface soils in the winter easily forms a loose covering that is washed away at the first heavy rainfall.[14] It is estimated that the Potomac carries annually past Point of Rocks, which is some distance above the fall line, 771 million kilograms of dissolved matter and 212 million kilograms of solids in suspension, a total of over 400 pounds of material from every acre of land in its drainage basin.[15] The James at a ten-foot flood crest removes from 275,000 to 300,000 cubic yards of solid material during each twenty-four hours and annually carries away between three and four million cubic yards of soil from the region above Richmond.[16] The Roanoke bears between three and four million tons of material annually, a portion of which represents the very richest soils from the Piedmont of Virginia.[17]

It is thus apparent that a goodly part of the problem of exhaustion in this region is produced by erosion. The type of soil, the lay of the land, the character of the rainfall and climate, all tend in the same direction. Varying in its intensity with the type of agriculture, it nevertheless presented a vital problem in every period and under every system employed. In the seventeenth century, William Byrd was lamenting the damage done by the floods to "me & my neighbors" and it was the loss of "ye soil" on "ye low grounds" which most impressed Roger Atkinson in the great freshet of 1771.[18] In the next century Edmund Ruffin declared that, "the damage caused to all our broken lands by the washing away of soil, has been much greater than all the exhaustion by the growth of crops,"[19] and one of his contemporaries lamented that improvement in the counties on the Dan and Stanton was absolutely impossible because when "we manure our lands, . . . the first heavy rain carries that, and what soil there may be, to the bottoms."[20]

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[11] Letter of Col. Richard Bland to J. Adams, *Virginia Magazine of History and Biography*, VI, 127-28; *Farmer's Register*, IV, 506-507; River (James) rose at rate of five feet an hour. Total rise in three days was forty feet.

[12] *The Thomas Jefferson Papers* (MSS), Vol. 29, No. 16927-8 (Library of Congress).

[13] R. O. E. Davis, *op. cit.*, p. 7.

[14] *United States Geological Survey, Water Supply and Irrigation Papers, No. 192*, p. 299.

[15] "Data of Geo-chemistry," *United States Geological Survey Bulletin, No. 491*, p. 68.

[16] *Report of Chief of Engineers, United States Army*, 1885, Part II, p. 947.

[17] W. W. Ashe, *Review of Reviews*, XXXIX, 439-41.

As frontier regions, the problem of the American Colonies was to find some product for exchange with the old world that would enable them to secure those necessities which a primitive region did not offer. The raw products of a virgin continent did not supply the means with which the wants developed in Europe could be satisfied. The absence of a ready supply of precious metals or of those tropical products so much desired at the courts of the new nations, forced an ultimate dependence upon agricultural resources. A supply of fish, furs, or timber gave some temporary relief, but the development of a permanent and satisfactory exchange, in the end, depended upon the soil.[21]

Virginia and Maryland early solved this problem with the abundant yields of tobacco which their "lusty soyle" gave forth and by the eagerness with which a ready market absorbed the increasing crops.[22] Within a short period of time a type of life, based on this exchange, was possible that rivaled that of the English gentry and the plantation hospitality and style of living found in the region, filled the less fortunate with envy and the traveller with wonder. "It was merry England transported across the Atlantic, and more merry, light, and joyous than England had ever thought of being." Colonial life came to rest almost completely upon tobacco, and in spite of all efforts at restricting and diversifying production, tobacco became the one object of endeavor. And the very conditions which made it the dominant crop, determined that its production should be at the expense of the soil. The story of colonial tobacco production, therefore, became one of uninterrupted soil depletion.

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[18] "Letters of William Byrd, First" (Letter Book), *Virginia Magazine of History and Biography*, XXIV, 356; "Letters of Roger Atkinson," *ibid.*, XV, 351-52.

[19] *Farmer's Register*, I, 355.

[20] J. C. Bruce, in *Farmer's Register*, I, 334-36; Thos. C. Jones, *ibid.*, VI, 1-2, "But as already observed, the land being hilly, generally ploughed shallow, and without the least regard to the destructive consequences of washing, the country around me presents, with some exceptions, a scene of barren hills and gullied valleys;" also *Farmer's Register*, IV, 33-34.

[21] *Maryland Archives*, I, 307; C. M. Andrews, "Colonial Commerce," *The American Historical Review*, XX, 55.

[22] *The True Travels, Adventures, Observations of Captaine John Smith in Europe, Asia, Africke, and America beginning about the Yeere 1593 and Continued to this Present 1629*, I, 115. Crop in 1618, 20,000 lbs; 1620, 55,000;

To begin with, tobacco by its great advantages in exchange excluded all other major crops from the fields and forced an exhausting single-crop type of agriculture upon the soils. Tobacco alone seemed capable of lifting the colonists quickly from the severe conditions of frontier life into the comforts of former days. The European demand for this plant was rapidly increasing and the Spanish supply was far from keeping pace with the growing demands. Prices were so high that in the early days a man's labor in tobacco production yielded him six times as large a return as might be secured from any other crop.[23]

But there were other advantages. The yield of tobacco per acre was high, its keeping qualities good, and its weight, when ready for shipping, comparatively low—advantages great indeed where every acre of land had to be painfully won from the virgin forest, and where markets lay far across a stormy sea. Tobacco, alone could stand the long journey, pay the high costs of transpor-

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1627, 500,000; 1639, 1,500,000; 1664, 23,750; 1688-89, [illegible]8,157,000; 1699-1709, 28,858,666, M. Jacobstein in *The South in the Building of the Nation*, V, 158-59; R. A. Bock, *10th Census* (*U. S.*), *Statistics of Agriculture*, p. 212.

[23] Captain John Smith before the royal commissioners, *Works of Capt. John Smith*, pp. 565, 615; "Of grain and pulse they provide commonly no more than they reckon that their families will require, for there are no towns as markets where they can sell them. . . . The only thing of which they make as much as they can is tobacco, there being always a vent for that at one time or another of the year. . . .," *Calendar of State Papers, America and West Indies, 1696-1697*, p. 643.

tation, and still return a profit to its producer.[24] Furthermore, labor, always scarce, could be concentrated upon a smaller acreage with greater returns from each laborer,[25] and thus also afford a sufficient supply of hands in the winter to clear the new lands needed for future crops. Tobacco growing and land clearing went hand in hand, as we shall see, and so closely did the double task become united that in later years, when tobacco profits had failed, many refused to give it up because they would then have no winter work for their slaves.[26]

With such advantages, tobacco was fixed as the "great export staple" and its production determined the whole agricultural life of the region. The intensive character of the effort it required and the constant attention it demanded from the time of the preparation of the seed-bed until the crop was on the way to market, left little time for other things. Its periods of soil preparation, seed planting, and crop harvesting coincided with those of corn and wheat and little time could be given even for raising enough of these to feed the plantation. Where possible, the great planters were soon buying a part, at least, of their food stuffs and giving all their time and effort to "the great staple." Time could not be spared from the tobacco fields for less remunerative work and tobacco gave no period of rest during the growing season.[27] "It would startle even an old planter to see an exact account of the labour devoured by an acre of tobacco, and the preparation of the crop for market," says John Taylor of Caroline, . . . "he would be astonished to discover how often he had passed over the land, and the tobacco through his hands, in fallowing, hilling, cutting off hills, planting and replanting, toppings, succerings, weedings, cuttings, picking up, removing out of the ground by hand, hanging, striking, stripping, stemming, and prizing."[28] If tobacco was to be the great crop, then other things were impossible and a single-crop type of agriculture was inevitable. As Governor Hart of Maryland said, the lands were excellent for other crops but their growth was impossible because "the making of tobacco employs all their time and care."[29]

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[24] "As to other commodities producable here, as pipe-staves, timber works of all kinds, and corn. . . . our position is so remote that the cost of freights and transport devours the whole produce." Colonel Nicholas Spencer to Sir Leoline Jenkins, May 13, 1681, *Calendar of State Papers, Colonial Series, America and West Indies, 1681-1685*, p. 47.

[25] P. A. Bruce, *op. cit.*, I, 255.

[26] John Taylor, *Arator*, pp. 26-29.

[27] *Calendar of State Papers, America and West Indies, 1681-1685*, pp. 131, 497.

[28] *Arator*, p. 232.

Such a course meant soil depletion. The tobacco plant is a heavy consumer of both nitrogen and potash and the removal of the entire growth from the field, as was customary, caused a rapid decline in the available plant food materials at the same time that continued replanting in the soils encouraged toxicity, harmful soil fungi, root rots, and micro-organisms.[30] A superior tobacco could be produced only on fresh land, and after the second crop—usually the best—the quality and quantity began to decline. The planter seldom counted on more than three or four crops from his land before it was abandoned to corn and wheat and then to the pine, sedge, and sorrell growths which usually characterize "sour lands." Only the freshest lands could be used for the staple whose yields meant so much. In fact, the terms "tobacco lands" and "new lands" soon became synonymous.[31] A constant clearing of the forest was carried on and a constant abandonment of "old fields" followed at the other end.[32] The encroachment upon the forest was so steady that one observer was led to remark that the colonists seemed "to have but one object"— "the plowing up of fresh lands."[33] "He was the cleverest fellow who could show the largest new ground."[34]

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[29] Quoted by M. S. Morriss, *Colonial Trade of Maryland, 1689-1715 (Johns Hopkins University Studies in Historical and Political Science*, Series 32, No. 3), p. 18.

[30] E. B. Vorhees, *Fertility*, p. 312. "A crop yielding 1,000 pounds of leaf per acre will contain in round numbers 67 pounds of nitrogen, 9 of phosphoric acid, and 85 of potash"; *Virginia Agricultural Experiment Station Bulletin, No. 183*, June, 1909, pp. 8-9; J. F. Duggar, *Southern Field Crops*, p. 523.

[31] William Tatham, *An Historical and Practical Essay on the Culture and Commerce of Tobacco, passim.*

[32] The story of clearing new land and abandoning old, is told by almost every traveler. See Clayton, *Force Tracts*, III, or A. Burnaby, *Travels through the Middle States of North America*, as examples separated in time.

[33] *American Husbandry*, I, 144.

[34] *William and Mary College Quarterly*, XXVI, 145.

As tobacco employed all the labor force and monopolized the best lands, so it also excluded the production of a supply of animal manure by which fertility might have been restored and maintained. This was not a serious matter as long as an abundance of fresh land was available for all, but it produced destructive habits that were hard to break and which brought loss and suffering in the not-far-distant future. The building of barns and yards for stock, the laying down of meadows for pasture, and the securing of a supply of winter's food, were out of the question as long as tobacco ruled. The time for taking care of stock was lacking; land had a greater value than when given over to meadows; and the marshes and woodlands offered what was deemed sufficient food for the quantity of stock needed under the existing system. Nor were horses more abundant. Tobacco was tended by hand labor, and the need for horses came largely on the infrequent journey that could not be made by water or for the amusement afforded in the hunt or on the improvised race track.[35] And neither received enough care to give greatest returns. The scanty supply of cattle roamed the forest or ventured into the swamps to gather an insufficient sustenance. The losses from accident and wild beasts were great, but were nothing as compared to those from starvation in the winter months against which no preparation had been made in the way of food supplies. If only a number sufficient to meet the needs for breeding stock survived the winter to grow fat with the return of spring, the colonist had no complaint to make.[36] Aside from an occasional penning at night no use whatsoever was made of the manure which even this scanty supply of stock might have afforded, or no effort was made to increase it—a situation which ran well down to the Revolution except in districts where the more thrifty Germans settled.[37]

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[35] On the scarcity of horses in Virginia see, "Description of Virginia," *Force Tracts*, III, No. 8, p. 1; Bruce, *op. cit.*, I, 298.

[36] Robert Beverly, *History of Virginia*, p. 252; *Maryland Archives*, XX, 269. Some 25,429 cattle and 62,373 hogs perished in Maryland in the winter of 1694-1695. The story is told over and over again of the planter who discharged his new overseer because he had protected the cattle so well that not enough had starved to death to furnish the leather required on the plantation.

[37] *History Register*, V, 152; B. C. Steiner, *Western Maryland in the Revolution (Johns Hopkins Studies*, XX, 5-6).

Such neglect and failure to realize on stock as a source of fertilizer was a constant matter of interest to the European travelers. From the earliest days when Clayton and Glover commented on the situation, down through Michel, Kalm, De Warville, and Anburey,[38] only to mention a few, runs the same note of surprise. Even at the end of the eighteenth century, Thomas Jefferson was answering Arthur Young's questions as to how a man could produce 5,000 bushels of wheat by means of cattle worth only £125, by reminding him that "manure does not enter into this because we can buy an acre of new land cheaper than we can manure an old one."[39] Paying returns could best be gotten by planting new ground, skimming off the ready fertility, and then passing on into lands newly cleared from the forest.

But the influence of the frontier was not confined to the establishing of a single crop type of agriculture. The scarcity of capital as well as of an intelligent and plentiful supply of labor, played a part in the work of soil spending. Crude tools and poor labor joined forces with mono-culture. Tobacco from the earliest period was cultivated with the hand and the hoe, the fields being kept clean and the surface soils loose by a continual but shallow stirring at the roots of the plant. Heavy wooden plows were introduced into the colonies around the year 1609, but they were not used in tobacco cultivation because of the constant use of new lands filled with stumps, roots, and other impediments incident to freshly cleared ground.[40] In fact, the plow did not become a factor

[38] John Clayton, "A Letter . . . to the Royal Society," *Force Tracts*, III, 20-21; *DeBow's Review*, XXV, 205-214; "The Journey of Frances Louis Michel, " *Virginia Magazine of History and Biography*, XXIV, 296, (tells oft repeated story of man who lost 102 of his 103 cattle and then gave the survivor away); Peter Kalm, *Travels in North America*, II, 51-52; J. P. Brissot de Warville, *New Travels in the United States of America*, pp. 432-36; Thomas Anburey, *Travels through the Interior Parts of the United States of America*. . . . pp. 449-450.

[39] *Letters on Agriculture, from his Excellency George Washington to Arthur Young and Sir John Sinclair*, pp. 103-104.

[40] *Calendar of State Papers, Colonial Series, America and West Indies, 1696-1697*, pp. 642-43, ". . . There are few places where the plough is used, for in their first clearing they cut the trees down two or three feet from the ground and never grub up the stumps. The ground must therefore be tended with the hoe, and by the time the stumps are rotten the land is worn out. Having fresh land. . . . they never recruit the old fields with dung. . . ."

in the tobacco fields until late in the colonial period, when a check had come to expansion and "old lands" were again brought into use. And even here the cultivation was shallow and the use of the hoe still predominated.[41] The lower reaches of the soil were not touched and turned up to the surface to give new supplies of food materials nor the depth given to the surface soils that would enable them to absorb the rainfall and prevent washing. The whole cultivation thus invited erosion. The clean surface and the constant stirring without piercing the hardpan formed just below, gave added force to the already great natural conditions which tended in that direction.

And the destruction was only increased when tobacco cultivation ceased. As tobacco moved on into new lands, the fields still clean and open, were either left unused and neglected, to be quickly cut into deep gullies, or were given over to a period of wheat and more likely to a succession of corn crops. And corn cultivation was even more conducive to erosion than was that of tobacco. In the earlier period the hoe was used for corn the same as for tobacco but the clean condition of the earth soon encouraged the use of the plow to prepare the ground for the seed and to keep the growing crop free from weeds. But this did not bring the turning up of the subsoil, for the heavy wooden plows of first days and the lighter shovel plow of later times, only "scratched" the surface and exposed it to the same old heavy washing. Even the best plows were little more than a "rough hewn stick" for a beam, into which was framed another stick fitted at the end with a rude plate of bog iron.[42] Plows that would cut even to the depth of six inches did not come in until near the end of the eighteenth century and then only among the few. It was another twenty-five years before they found a general acceptance and any wide use.[43] As late as

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[41] In 1776, Landon Carter declared that his father from 1727 to 1732 had used no plows even in the cultivation of corn and wheat, and yet was able to gather larger crops than his son could produce in the effeminate days of plows, carts, etc., "Diary of Landon Carter," *William and Mary College Quarterly*, XVII, 17-18.

[42] C. L. Flint, "A Hundred Years of Progress," *U. S. Dept. of Agriculture, Annual Report, 1872;* Ed. Eggleston, "Husbandry in Colonial Times," *Century Magazine*, V, Jan., 1881.

[43] In 1787 Washington received plows from Arthur Young that were supposed to cut from 6 to 8 inches, but in practice they seldom equaled those figures. Young to Washington, Feb. 1, 1787, *Papers of George Washington* (MSS), Vol. 237; E. L. Bogart, *Economic History of the United States*, p. 137.

1798, after buying the best plows to be found in Europe and America, Washington found that they did not penetrate the under stratum of hard clay on his lands, but only loosened the upper soils so that they were swept off into the furrows by the rainfall, and the fields cut into "injurious and eye-sore gullies." Finding no remedy he decided to give up the cultivation of corn entirely and to purchase his supply from the outside.[44]

And not only did the cultivation of corn give wider extension to shallow cultivation, but it added to the work of erosion by introducing a system of cross plowing. In this, the shallow furrows ran straight up and down the hillsides to become veritable watercourses in time of rainfall, and to bear the loose dirt, swept from the uplands, down in torrents to the lower levels and on out into the muddy streams below. It was this feature of corn cultivation which caused the more observant to consider corn an even more exhausting crop than tobacco and to be one of the chief contributors to the abandoned fields which appeared on every side.[45] Years later, in the early days of the nineteenth century, when the wide extent of ruin demanded a taking of stock and a fixing of responsibility, James Madison declared that "shallow plowing and plowing up and down the hilly lands, have, by exposing the loosened soil to be carried off by rains, hastened more than anything else the waste of its fertility."[46]

Furthermore, the labour employed, favored exhaustion. Ignorant, careless, and without an interest in the soil upon which he worked, the laborer fell directly in with the general work of destruction. A laborer cost four times as much as the land which he could tend, and, as Washington explained to Arthur Young, economy forced the farmer to make the most of his labor regardless of the effect upon the land.[47] A cheap, permanent supply of labor was the end to be desired, not the preservation of the land.

[44] *Papers of George Washington* (MSS), Vol. 288, Washington to Col. Wm. A. Washington, April 5, 1798.

[45] "The fact stares us in the face, that our most impoverished fields, even the most level of them, owe their condition more to the crops of Indian corn than to any other crop," *Letters and Other Writings of James Madison*, III, 85-86; *DeBow's Review*, XXIV, 81-89.

[46] *Letters and Other Writings of James Madison*, III, 78-79.

[47] Bruce, *op. cit.*, I, 517. Slaves cost from 30 to 60 pounds, land under the headright system 2⅗ shillings per acre or less; allowing 40 acres to each slave, the ratio in favor of labor is 4 to 1. *Letters on Agriculture. . . .* June 18, 1792, p. 63.

It is hard to say how much of the trouble was inherent in the systems of indenture and slavery, and how much was due to the character of the laborer, regardless of the system under which he worked, to the staples cultivated, and to the presence of so much good land.[48] Whatever the case, it seems clear that neither the the white indentured servant who predominated in the seventeenth century nor the negro slave who held sway during the remainder of our period, had either the intelligence or the incentive to run counter to the general drift of the whole system of exhaustion. Indentured servants were always changing as new men were introduced to take the places of those who themselves had scarcely learned the required processes of the plantation. Individually they were sometimes men of good character and sometimes only such as "hunger and fear of prison" brought out to the colonies;[49] but good and bad alike had only a passing interest in the work at hand, and little or no knowledge of the methods of good farming.

The slave proved more profitable because of his permanence but added nothing in intelligence or interest in his task. Some writers are even inclined to blame the wide continuance of the single crop system upon the negro, insisting that his ignorance and "want of intelligent interest" rendered profits possible only when he was kept at the one type of agricultural operation which he had learned. Perhaps he received some blame that was not entirely deserved but the almost universal verdict was that the laborer who could "wield only a hoe or an ax" and "who could be kept moving only by the constant efforts of a driver," must in the end cause the land on which he toiled to "suffer the sure course of exhaustion."[50] The force of soil exhaustion in explaining the well known expanding quality of slavery cannot be overlooked.

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[48] Bruce, *op. cit.*, II, 61. It should be clearly understood that indenture and slavery were but the systems under which white or black men labored on farms or plantations. The labor system influenced the matter of exhaustion only as it determined the motives of the laborer; the race of the laborer played a part because of difference in native intelligence; and the size of the unit upon which either labored was a factor only in so far as it offered opportunity for more or less of efficiency. The distribution of blame is difficult but it appears from the evidence to be given later that the matter of race was the more important element.

[49] Sir William Berkeley, *A Discourse and View of Virginia*, p. 4.

[50] J. E. Cairnes, *The Slave Power*, p. 44-45; E. L. Bogart, *Economic History of the United States*, p. 294; U. B. Philips, *American Negro Slavery*, pp. 344-58; A. Maurey, *Memoirs of a Huguenot Family*, p. 364; *Farmer's Register*, I, 36; Thomas Jefferson, *Notes on Virginia*.

And both indentured servant and slave required the use of the much sinning and much sinned against overseer. The increase of the number of laborers and the scattering of the lands held by a single individual, to be discussed later, made it impossible for the owner to give personal attention to his workers. This fact combined with the scarcity of good lands that could be rented, led those who did not become planters to accept the position as overseers.[51] The overseer's pay was usually a portion of the crops he raised, and he found it to his advantage to get from both the soil and the laborers the greatest immediate return regardless of future consequences.[52] Seldom remaining with the same planter more than one year, his methods of "skinning the lands" were often only matched by his own ignorance. "He is bribed . . . to impoverish the land," was the comment of John Taylor.[53] "The unprincipled ravages," of "these worthless wretches" caused "the lands to suffer a thousand times more than tenant farmers would have done" and prevented the introduction of better methods of farming.[54] Yet the overseer was a permanent part of the agricultural machinery of Virginia and Maryland from 1622 until the middle of the nineteenth century.[55]

A frontier was thus exploiting its natural resources and the results seemed to justify the procedure. The destruction of a little land amid such an abundance, was a matter of small consequence compared to the rapidity with which wealth and luxury were replacing privation and simplicity. There were lean years, of course, but good profits were to be made from tobacco during the greater part of the first fifty or sixty years and the splendid life that was rising in the river valleys bore convincing testimony to the fact. In 1619, John Posy was telling of a man who "by his owne labour hath in one yeare raised to himselfe to the value of £200 sterling," and of another who "by the means of six Servants hath cleared at one crop a thousand pounds English."[56] In the middle of the century, even after the first boom days had passed, Bullock estimated that a planter who "invested £50 sterling, would be in possession of an estate worth six hundred" at the end of two years,[57] and in 1686, in spite of losses during the last years, William Fitzhugh wrote of the growth of his plantation from 1,000 acres to 54,000 acres, of "good debts lying out to about 250,000 pounds," and of negroes whose increase would "keep the stock good forever."[58] He counted the profits which had been made on his plantation as three times greater than could have been made at the same time in the mother country.[59] All evidence seems to point in the same direction and a modern scholar has declared that it is doubtful if ever a surer road was opened to the man of industry to go on to wealth and respectable influence than in the tobacco region during the seventeenth century.[60]

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[51] P. A. Bruce, *op. cit.*, II, 17; I, 411.

[52] Landon Carter paid from 1/8 to 1/12, *William and Mary College Quarterly*, XX, 280; Charles Handsford paid 1/2; average ran from 1/2 to 1/20, Bruce, *op. cit.*, I, 253; *Farmer's Register*, IV, 1; Thos. Jones paid 1/10 and "doth agree to find a negro women to cook. . . . vitaals and attend the overseer," *Jones Family Papers* (MSS), (1780-90); C. P. Gould, *Land System of Maryland* (*Johns Hopkins University Studies*, XXXI, No. 1, 72-76).

[53] "This necessary class of men are bribed by agriculturists not to improve, but to impoverish their land. . . ." *Arator*, pp. 68-69, 70-71.

[54] *Writings of Thomas Jefferson*, VI, 509-510, to George Washington, May 14, 1774; *Letters on Agriculture*, . . . *Washington to Arthur Young*, p. 49; *Farmer's Register*, I, 36; "Landon Carter's Crop Book," *William and Mary College Quarterly*, XXI, 14-16.

[55] P. A. Bruce, *op. cit.*, II, 17 (note).

But the frontier did not work alone in shaping the agricultural practices in Virginia and Maryland. It found potent allies in the work of destruction in the British government and in the marketing conditions which had developed for handling the staple both in America and in the Old World—forces which were even more enduring than the frontier.

The relation of these factors to the matter of soil exhaustion consists in the added strength which their regulations, duties, and charges gave to the single crop type of production and to the soil robbing methods of cultivation already in force. Colonial agriculture was never allowed to run a natural course of development or to find free and natural markets. The government influenced the crops raised and the markets used and by the duties it collected greatly affected the final selling price and the profits which the colonist received for his crops. And the influence of the government was supported at every turn by the British merchants who had charge of shipping and marketing the harvest.

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[56] Quoted from the *Barlow Manuscripts* in G. L. Beer, *Origins of the British Colonial System 1578-1660*, p. 243.

[57] Bullock, *Virginia*, p. 35.

[58] "Letters of William Fitzhugh," *Virginia Magazine of History and Biography*, I, 395-96.

[59] *Ibid.*, II, 22-23.

[60] J. S. Bassett, "The Relation between the Virginia Planters and the London Merchants," *American Historical Association Report*, 1901, I, 563 *et seq.*

In the early days of tobacco planting, crown, proprietor, and colonial government alike struggled against the economic forces that were making tobacco the sole object of colonial endeavor. The colonies had been planted, not for the development of their own genius, but for the creation of profits and the advancement of the interests of the many who remained at home. The disposition to look after their own interests and develop activities that did not agree with those prescribed by their sponsors, could not pass unnoticed. The early regulations, therefore, had as much for their object the restriction of tobacco and the diversification of agriculture as they did the increasing of profits by the regulation of quality and quantity.[61] Pursuant to this end, the number of plants which might be raised by each individual and the number of leaves which might be allowed to mature upon each plant were carefully restricted;[62] inspection was provided and inferior qualities were ordered to be burned;[63] each planter was required to produce a minimum quantity of food stuffs[64] and inducements were given for the introduction of other staples, such as silk, flax, wine, etc.;[65] and in order to insure a maximum enforcement of these laws, efforts were made at securing the closest cooperation between the two colonies.[66]

But the rising profits from tobacco soon overcame the unfriendly attitude of the authorities and restrictions gave way to encouragement and the object of regulation became largely one of adding revenue to the Royal treasury. In the latter half of the seventeenth century, tobacco planting was practically forced upon the colonists and any effort at variation from the single crop or restriction of its growth, was met with official discouragement or rejection. In 1662, when the colonists of Virginia asked for the prohibition of all planting for the next year, the request was promptly rejected and orders given that no such document should be presented to the Council again. Baltimore followed a like policy in Maryland in this period and the Secretaries for the colony in the later period saw to it that the colonists did not "turn their thoughts to anything but the Culture of Tobacco."[67]

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[61] G. L. Beer, *Origins of the British Colonial System, 1578-1660*, pp. 78-100, 257-58; Cunningham, *Growth of English Industry and Commerce*, p. 358 (note).

[62] Wm. Stith, *History of Virginia*, pp. 195-205; W. W. Henning, *Statutes at Large*, I, 135, 142, 152, 162, 165, 204, 225; II, 119, 224.

[63] Laws of Assembly, 1619, *Colonial Records of Virginia*, *Senate Document Extra*, 1874, p. 24; W. W. Hening, *Statutes at Large*, I, 224-25.

[64] *Maryland Archives*, I, 79, 97, 160, 251, 349.

[65] Beer, G. L., *Origins of the British Colonial System*, 1578-1660, p. 91.

[66] These failed largely because of Maryland's attitude. See Morriss, *op. cit.*, p. 24; Beer, G. L., *Old Colonial System 1660-1754*, II, Part 1, 119-22.

But even the effects of the earlier attitude of discouraging tobacco were against the soil. Instead of preventing the planting of tobacco and securing a turning to other staples, the restrictions placed upon tobacco only led to a more intensive planting of the most fertile soils—new lands—in order that a maximum yield might be secured under the limitations imposed. A premium was placed upon those methods which by "robbing the soil" gave the greatest immediate returns and in so doing led to a more rapid abandonment of the slightly reduced soils than would usually have been the case.[68]

The essential features of the later policy that are of interest to us were first, the requirement that tobacco be shipped only to England, and second, that all tobacco entering the country must pay a duty to the crown. These regulations varied in detail from time to time but retained the same general essentials from the days of the early Stuarts down to the end of the British control in the Colonies. These two features of the policy were closely related—the restriction of all shipments to England having as its purpose the collection of a customs duty—and the two may be considered as one in their effects upon colonial agriculture.

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[67] Governor Nicholas wrote near the end of the century that he prayed God "the seasons might be as in the early days so that the tobacco planters both here and in Maryland, may be encouraged to follow it (tobacco) and not go upon other projects," *William and Mary College Quarterly*, II, 168; XX, 256; *Calendar of State Papers, America and West Indies, 1681-1685*, pp. 497, 506 (Culpeper to Lords of Trade, and Journal of Lords of Trade and Plantations); Beer, G. L., *Commercial Policy of England towards the American Colonies* (*Columbia University Studies in History, Economics, and Public Law*, III, No. 2), p. 46; P. A. Bruce, *op. cit.*, I, 389-92; M. S. Morriss, *op. cit.*, pp. 42-43; *Calendar of State Papers, America and West Indies, 1693-1696*, p. 519.

[68] Bruce, *op. cit.*, I, 321-23.

Spanish tobacco had been subject to duty even before the American colonies were established,[69] and James I, under the pressure for revenue in his struggle with Parliament, was quick to see the opportunity offered in the rising exports of that staple from Virginia. In 1619, in return for limitations placed upon tobacco growing in England and for restrictions laid upon the Spanish import, the Virginia Company agreed to pay one shilling per pound on its tobacco,[70] and in 1621, the Orders in Council required that all products from the colony be sent to England.[71] The instructions to Governor Wyatt in 1639 and to Governor Berkeley in 1641[72] were to enforce these regulations and in 1631 a bond was required that all goods be landed in London and shortly afterward a person was appointed to keep register of all exports from the colony.[73] When Maryland was founded, these same regulations were contained in the grant of territory and the same general policy—if so loose a system may be called a policy—was thus made to cover the entire tobacco shipment.

These regulations in spite of the precautions taken, were never rigidly enforced, especially against the Dutch traders, and the first days of the Civil War in England saw them entirely disregarded. It was not until the Navigation Act of 1660, that they became a part of a firm and consistent policy that was enforced with any degree of rigidity.[74]

The first Navigation Act of 1651 confined all carrying trade to English bottoms and the Act of 1660 listed tobacco with other enumerated goods that were to be shipped only to England and laid a two penny duty upon each pound of tobacco imported. Under James II, a further burden of three pence was added and the "New Subsidy" of one penny under William III, together with one-third penny of Queen Ann's reign, brought the total duty on tobacco up to six and one-third pence—all of which, save one-half penny, was to be refunded in drawbacks on reexportation. This remained the schedule of duties until the Subsidy of 1747 was passed, adding another penny to the existing duties.[75]

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[69] G. L. Beer, *The Commercial Policy of England Towards the American Colonies* (*Columbia University Studies in History, Economics and Public Law*, III, No. 2), pp. 1-8.

[70] Stith, *History of Virginia*, p. 170.

[71] Bruce, *op. cit.*, I, 348.

[72] Bruce, *op. cit.*, I, 321-23.

[73] G. L. Beer, *Origins of the British Colonial System, 1578-1660*, p. 205.

[74] Bruce, *op. cit.*, I, 348, 356-60.

Meanwhile the colonial governments had been seeking revenue from tobacco. Maryland early imposed taxes but the Act of 1671 of *2s.* per hogshead is the first of importance. Other duties followed and in 1717 they totaled *3s. 9d.* per hogshead, a level maintained until another *3d.* per hogshead was added in 1747.

Virginia likewise imposed export duties and her Act of 1653 of *2s.* per hogshead became permanent in 1662 and yielded "a large revenue" to the government. Later when bulk tobacco shipments became common, a duty of *2s.* per five hundred pounds was agreed upon and the schedule, thus fixed, remained to Revolutionary days.[76]

The effect of these restrictions and duties upon the agriculture of the colonies, and therefore upon the soil, was necessarily in proportion to the burdens which they imposed upon the planter and the degree to which they required him to employ exhausting methods. The exact extent of this burden and the share which it played in producing the exhausted and abandoned fields which were now appearing, cannot be directly measured. The laws were often evaded and illegal trade must always be reckoned with. Furthermore, so many other factors were operating and these forces so indirect, that it is only contended here that any new burdens added to those already at work in the same direction, necessitated a greater reliance on the spending of the soil's original fertility as a means to continued production. No single cause will explain so complex a matter and the effort here is not to center the blame but rather to indicate those implicated.

It is generally admitted that the restriction of all shipments of tobacco to England worked a serious hardship upon the planters. The lower grades of tobacco which had found a market on the continent could ill afford to bear the increased load of duties and costs of reshipment. .And since they could not find a sale in the market already over-burdened with the higher grades, they remained unsold in the hands of the planter.[77] This placed a premium upon the raising of high grade tobacco and the use of only the most fertile fields. Abandonment took place quickly under the pressure for quality and quantity and abandoned fields were left clean and open to suffer the ills of erosion. But the better grade tobaccos also suffered from a restricted market and, at least in the early years after 1660, felt the effects of the increased planting in the countries against whom the restrictions had been aimed. The losses in the Dutch markets were heaviest. The Dutch had paid high prices for tobacco and offered their manufactured goods in return at prices far below those of the British traders. Their freight rates had been cheaper and their charges for shipping in general lower.[78] True, tobacco could be reshipped from England with drawback of most of the duties, but the shortage of ships, "the long and troublesome procedure of reshipping," to say nothing of the added expense and the now hostile attitude of Holland, discouraged this to a degree. The English market was, therefore, completely glutted from around 1662 until about 1682 when the surplus became so great and the prices so low, that tobacco simply overflowed the island and captured the trade of the continent regardless of obstructions in the foreign markets.[79] But this gave only temporary relief to a condition that became the normal status and the planters shared in this relief to only a very slight extent.[80] Continental wars soon interfered to check even this overflow and the promising trade which had been opened up on the Baltic suffered heavily. By 1707, the Russian outlet was almost completely closed.[81] In a short time Holland again regained her markets and the early days of the eighteenth century saw the colonists without profitable markets and, in the words of a contemporary, reduced to a condition "where the labor in tobacco" would not afford the planters "clothing to shelter them from the violent colds as well as heats" . . . and the "importation of British and other European commodities . . . whereby the planters were formerly well supplied with clothing, . . . now in a manner wholly left." This writer declared that: "Many families formerly well clothed and their houses well furnished are now reduced to. rags and all the visable marks of poverty."[82]

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[75] G. L. Beer, *Commercial Policy of England toward the American Colonies*, (*Columbia University Studies in History, Economics, and Public Law*, III), 36 *et seq.*; *The Old Colonial System, 1660-1774*, II, Part 1, 116.

[76] A. A. Giesecke, *American Commercial Legislation Before 1789*, pp. 45-49.

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[77] See Bland's Memorial below. *Virginia Magazine of History and Biography*, I, 141.

[78] T. J. Wertenbaker, *The Planters of Colonial Virginia*, pp. 84-91. Bruce, *op. cit.*, I, 349-50.

[79] *Ibid.*, 115-33.

[80] G. L. Beer, *Commercial Policy of England toward the American Colonies*, (*Columbia University Studies*. . . III, No. 2), p. 50.

[81] *Virginia Magazine of History and Biography*, IV, 55-63; *Calendar of State Papers, America and West Indies, 1704-1705*, pp. 505-6, 741.

As to the harmful effects of the duties collected upon the colonial staple by the English Government, there may be some question. It has been generally assumed that the duties on tobacco simply raised the final selling price and the burden was therefore borne entirely by the consumer.[83] Yet certain circumstances in the tobacco trade might indicate that this was not entirely the case. Tobacco was, of course, a luxury of only comparatively recent introduction and both on the count of being a luxury and because of its newness would, under free conditions, be subject to a very elastic demand. A higher selling price due to added duties would therefore naturally limit consumption to a degree, but give compensation in the form of higher prices. Yet it should be remembered that at this very time, the force of a restricted market was operating in the opposite direction to reduce prices and in a glutted market the added duties were not liable to greatly affect the selling price of the commodity or to allow a duty to be shifted to the consumer. Had the production of tobacco been elastic and quickly and easily adjusted to the demands, the case might have been different and followed the ordinary course. But other forces already dealt with, gave a constant pressure for continued production and the demand seemingly had little effect on the supply until complete ruin brought a halt.[84] Under these circumstances the price of tobacco did not rise with the duties and it seems reasonable to conclude that the burdens of the government fell largely upon the planters in the colonies who continued to pour their crops into an already saturated market. And the planter in turn shifted them in as far as possible to his natural resources and continued his production by a greater spending of the soil's natural fertility. The case, however, is so involved that it need not be pressed beyond the suggestion of the probability in the matter and the noticing of how closely the facts fit the suggestion.

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[82] Co5- 1316, *Petition of Council, Correspondence of Board of Trade*, quoted in Wertenbaker, *op. cit.*, p. 150; ". . . We . . . cannot but observe to you . . . the miserable and deplorable circumstances of many good planters, to whom their servts. and slaves are become even burthensome by the low price of tobacco's at home. The generallity of the Planters, especially such as have shipped their tobaccos to their correspondents in London, are become greately indebted to the merchants and very many of their plantations and stocks are wholy mortgaged and forfeyed to them, and others dayly desert their abodes for feare of being imprisoned, and repair to the Southern Colonys, . . .," President and Council of Maryland to the Council of Trade and Plantations, *Calendar of State Papers, Colonial Series, America and West Indies, 1710-1711*, pp. 250-251; see also, *ibid.*, p. 418 (Men refusing to serve as Sheriffs); *ibid.*, p. 238 (Poverty prevents paying quit-rents).

[83] This is Beer's attitude and has been pretty generally followed by others. The evidence collected by Bruce does not seem to lead in this direction, though he does not argue the point.

Beginning almost immediately in the 1660's, with the passage of the Acts which restricted and taxed the colonial staple, the colonists entered into a period of prolonged depression. Within a few years the markets were so overcrowded that a large portion of the crops remained in the hands of the planters and they were resolving to disregard the royal decrees and prohibit the further planting of tobacco for a period of time.[85] The officials succeeded in preventing this and the price of tobacco in the colonies fell to the low point of half penny a pound. The price rose somewhat in the next decade but did not maintain an average of more than two and a half pence until after the middle of the next century[86]— a price that would not pay the costs of healthy production. Yet the quantity of tobacco produced in Virginia and Maryland continued to increase or at least to hold its own even in the periods of greatest depression.[87] Virginia alone in the sixties was producing "as much in two years as England could consume in three," and Maryland was holding her production at a rather steady level.[88] Meanwhile the duties collected by the government ran from 100 to 250 per cent ad valorem, and in the year 1677 alone Virginia paid into the royal treasury the sum of 100,000 pounds sterling and Maryland about half as much. The average annual return for the latter part of the seventeenth century and the early years of the next, ran to about 350,000 pounds gross, of which perhaps one-half was refunded. Tobacco was yielding more revenue to the crown than anything else from the colonies—a sum "more than the East Indies four times over."[89] Tobacco was indeed, as William Tatham[90] called it, "a jewell to the crown, as so large a sum arises out of the duties."

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[84] How well the men of the period saw this is shown by a letter from the Secretary of Virginia to Sir Leoline Jenkins, March, 1683: "The country is quiet. The rise of the price of tobacco has quieted the minds of our unthrifty inhabitants, who cannot be persuaded to undertake some new industry, but prefer to live miserably by tobacco. (Tells of failure of laws which aimed to check crop.) By my observations I cannot persuade myself that either cessation or a stint in the number of plants will effect what is intended. *The work must do itself: the crop must grow to such vast quantities that no one will come to fetch it, and then the law of necessity will force them to new industries. . . .*" *Calendar of State Papers, America and West Indies, 1681-1685*, p. 410, [Italics mine]; *ibid., 1710-11*, p. 72, (Debts, yet yields equal to past years); *ibid., 1685-1688*, p. 116.

[85] *Calendar of State Papers, America and West Indies, 1681-1685*, pp. 47, 94.

[86] M. Jacobstein, in *The South in the Building of the Nation*, V, 158-59; M. S. Morriss, *op. cit.*, p. 37-42.

And as the revenues rose, Virginia and Maryland sank into a state of poverty unprecedented in their history.[91] Both Governor Berkeley and John Bland voice the protest of the colonists against these regulations and the poverty they produced. Berkeley insisted that they benefited neither the crown nor the Mother-nation, but were "impoverishing" forty thousand people "to enrich little more than forty Merchants, who being the only buyers of our Tobacco, give us what they please for it and after it is here, sell it how they please." It was the purpose of these Londoners, he declared, to "bring us to the same poverty, wherein the Dutch found and relieved us" and to "take away the right of giving and selling our goods to whom we please."[92]

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[87] R. A. Bock, *10th Census* (U. S.), 1880, III, 212.

[88] Bruce, *op. cit.*, I, 394.

[89] G. L. Beer, *Commercial Policy of England toward the American Colonies* (*Columbia Studies in History, Economics and Law*, III, No. 2), p. 50; Morriss, *op. cit.*, p. 45-46; *American Husbandry*, I, 228; McPherson, *Annals of Commerce*, III, 163; Council of Trade and Plantations said in 1697 that customs to the Crown was £200,000, *Calendar of State Papers . . . 1696-1697*, p. 438.

[90] Wm. Tatham, *Essay on Culture and Commerce of Tobacco*, p. 195; The King has more revenue from Virginia "than all the Islands together," Governor Sir Wm. Berkeley to Sec. Lord Arlington, June 12, 1669, *Calendar of State Papers, America and West Indies, 1669-1674*, p. 27; "It cannot be denied that Virginia raises a greater revenue to the Crown by customs than any other plantation under his Majesty's dominions. . . .", Sir Henry Chicheley to Sir Thos. Chicheley, July 16, 1673, *ibid.*, p. 508.

[91] ". . .Our most formidable enemy, poverty, is falling violently on us through the low value, or rather no value of tobacco. It is now so under foot that we have no hopes of its advancing enough to give us means of subsistence. . . .," Colonel Nicholas Spencer to Sir Leoline Jenkins, May 13, 1681, *Calendar of State Papers, America and West Indies, 1681-1685*, p. 47; "The great quantities of tobacco grown in Maryland and other of your Majesty's plantations has brought the price so low that without speedy remedy we cannot much longer subsist. . .," The Council and Burgesses of Virginia to King, July 26, 1681, *ibid.*, p. 94; see also, *ibid.*, *1681-1685*, p. 424, "The inhabitants of the country are mostly extremely poor . . .;" for Maryland see, *ibid.*, *1693-1695*, p. 519; *ibid.*, *1696-1697*, p. 546; Bruce, *op. cit.*, I, 401.

Bland likewise charged the acts against the merchants who "would keep still in their own hands that Trade which they had engrossed and have nobody come here to hinder them."[93] He complained bitterly of the low prices given by the merchants, of the high prices charged for goods in return, and of the excessive freight rates placed on tobacco. He further called attention to the fact that the colonial products could be raised in nearly every country in the world, and unless they could be purchased cheaper in the colonies than elsewhere, they could not be sold. Then he significantly added, "It cannot stand with wisdom to hinder the Hollanders from going hither, for unless what is there produced be fetched from thence, the Planters will have little encouragement to manure the ground, or trouble themselves to take so much pains as they do, for what when obtained, they know not what to do therewith."

And the correspondence of the planter offers evidence of the same character. In 1686-87, William Fitzhugh found tobacco so low in price that he could not get one penny from it and had some three hundred hogsheads left unshipped on his hands. The next year he found it at the lowest point he had ever known—the entire crop hardly furnishing "the Servants with cloths and working tools that make it"—and the year following, since it was "more uncertain for a Planter to get money by consigned Tobacco than to get a prize in a lottery," he was changing his crop to the sweet scented type "in the hope of improved markets."[94] And it was "the great Tobo custom" which this planter held responsible for his losses and upon the "abatement" of which he awaited to make more "handsome consignments."[95] Such were the facts of production, duties, and profits in the early period following the introduction of the Navigation Acts. It is with difficulty that one can escape the conclusion that there was some connection between the government's policy and the colonial poverty.

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[92] Sir William Berkeley, *A Discourse and View of Virginia*, p. 6-7.

[93] John Bland's Memorial against Navigation Laws, *Virginia Magazine of History and Biography*, I, 141-45.

[94] Letters of Wm. Fitzhugh, *Virginia Magazine of History and Biography*, II, 15-16, 264-66, 374-75, 376-77. Bruce says the crop of 1664 caused the planters to fall into debt to the extent of fifty thousand pounds, *ibid.*, I, 391.

Before turning to the conditions in the eighteenth century and the more definite application of these conditions to the colonial agricultural methods and to the matter of soil exhaustion, another factor already referred to must be noticed—the Merchant trader through whose hands the planter carried on much of his selling and buying in Europe. The English middle-man had long been an agent in the exchange between the colonies and the mother country, and as has already been seen, he had come in for a share of the blame in connection with the hardships that had befallen the colonial planter. With the union of Scotland and England ~~in 1707, the~~ Scotch merchant made his appearance and the earlier dissatisfaction seems to have been greatly augmented by his coming. The merchant becomes a decidedly important factor in the story of the tobacco trade in the eighteenth century.

The charges made against the merchants were many. In the first place their commissions were high and they failed to purchase economically for the planters in English markets. As creditors for the planters they were able to force the shipment of all crops through their own hands and at their own prices, and by an organization effected among themselves in England were able to agree upon and fix the final selling price at the other end. And finally they handled the tobacco in Europe so as to incur heavy charges by which they secretly profited and so controlled legislation and manipulated the government duties and drawbacks as to gain whatever advantages might come therefrom.[96] "Merchants," runs a later Virginia comment, "have done more to produce the mischief than all the ignorant empiricism, ill judgement, and alleged idleness of the planters combined." It reiterates the charges of control of both purchase and selling prices, complains of 100% profits on goods returned to the planters and reaches the conclusion that the "merchants of Glasgow and London and their factors here, have been the great scourge of our landed interests and have grown rich thereby while our open lands have become poorer from year to year."[97]

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[95] Letter to John Cooper, May 6, 1689, *ibid.*, II, 374-75; Hugh Jones, *Present State of Virginia*, p. 35. "I know that frequently the duty is so high and the price so low that it is very hard for the merchant and planter to get little or nothing but their labor for their pains and expenses; for it has happened that planters who have had a great dependence upon their years crop of tobacco for the support of themselves and families have instead of clearing anything, been brought into debt by it, the charges and duties far overbalancing the price of tobacco." "Twice as much accrues to your revenue from our staple manufacture of tobacco as to ourselves," Address of the House of Burgesses of Virginia to the King, *Calendar of State Papers, America and West Indies, 1696-1697*, p. 438; *ibid., 1681-1685*, p. 94.

It is altogether probable that the merchant became the symbol of all the colonial troubles and that much charged against him was not deserved. It is also probable that the bad merchant was in the minority but like all sinners, attracted more public notice than the many good ones. It should also be remembered that the merchant himself was often caught between the upper and lower millstones of planter and government, and took much blame to himself that deserved to be placed upon other shoulders. The whole system of indirect marketing was expensive. The local merchant, if developed, could without doubt, have purchased more cheaply than did the English agent whose interests were not always in buying cheaply or in a competitive market.[98] The long weeks spent by the merchant's ships in colonial waters, in passing from wharf to wharf in collecting the scattered deposits of tobacco, had to be paid for by increased charges in freight, and the uncertainty of cargo at one end and of markets at the other kept the price at a figure which would safely cover any unforseen developments.

But the planter, at least, believed the merchant was the source of all his grief and against him hurled his complaints throughout the eighteenth century. Regardless of whether these complaints were always aimed at the right party they do show the misery of the planters in the period and sum up rather well the dissatisfaction with the burdens engendered by the system of indirect marketing. In this sense they also reveal the pressure that was added by the marketing system to the soils of the tobacco colonies.

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[96] *Calendar of State Papers, America and West Indies, 1710-1711*, pp. 250-251; "Virginia and the English Commercial System, 1730-1733," St. George L. Sioussat, *American Historical Association Report*, 1905, I, 71 *et seq.*; *Economics and Politics in Maryland, 1720-1750*, St. George L. Sioussat (*Johns Hopkins University Studies in Historical and Political Science*, Ser. 21, No. 6-7); *Writings of James Madison*, VIII, 429 (charges price fixing and organization).

[97] Cabell, "Report on Agriculture in Virginia," *William and Mary College Quarterly*, XXVI, 151.

[98] J. S. Bassett, "Relations Between the Virginia Planters and the London Merchants," *American Historical Association Report*, 1901, I, 561.

The disasters of the first ten years of the new century have already been noticed. Slight relief came in the second decade with European peace,[99] but this was followed in the next by perhaps the worst period in all the history of tobacco production, and the early thirties found the planters in dire distress and in violent protest. "In Virginia and Maryland," writes Benedict Leonard Calvert from Annapolis in 1729, "Tobacco is our Staple, is our All and indeed leaves no room for anything else; it requires the Attendance of all our hands, and Exacts their utmost labour, the whole year round: it requires us to abhor Communitys in townships, since a Planter cannot Carry on his Affairs without considerable Elbow room within his plantation. When All is done, and our Tobacco sent home, it is perchance the most uncertain commodity that comes to Market; and the management of it there is of such a nature and method, that it seems to be of all other, most lyable and Subject to frauds, in prejudice to the poor Planters. Tobacco Merchants, who deal in Consignments, get great Estates, run no risque and Labour only with the pen: the Planter can scarce get a living, Runs all the risques attendant upon trade, both as to his negroes and Tobacco, and must work in variety of Labour. I write not this in malicious Envy of the Merchants, nor do I wish them less success in business: but I heartily wish the Planter's Lay was better."[100]

The climax of protest is reached in a petition called "The Çase of the Planters of Tobacco in Virginia," sent by the Council and Burgesses of Virginia in 1733, in which the whole system of government duties and particularly the merchant abuses are aired. Excessive commissions are attacked as being greater than "the whole Balance coming to the Planter;"charges of fraud in the matter of payment of duties and the weighing of tobacco are made; and fear expressed that if checks are not imposed the merchants will soon make themselves masters of "the Estates of both the Tobacco colonies."[101] Accounts of tobacco sales are appended to show excessively low profits or even indebtedness on shipments of tobacco.

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[99] T. J. Wertenbaker, *The Planters of Colonial Virginia*, p. 151.

[100] Benedict Leonard Calvert, Annapolis, Md., Oct. 26, 1729, to Chas. Lord Baltimore, *Maryland Historical Society Fund Publication*, No. 34, 70.

From this period until the Revolution the complaints continue. Slightly improved conditions came in the fifties but the French and Indian war brought renewed disaster and recovery had not come when the final struggle began with the mother country.

In the late thirties, William Byrd was selling off his land and negroes "to stay the stomack" of his English agent[102] and in 1743 the Governor and Council of Maryland addressed their proprietor with a statement of complete ruin and abandonment of many tobacco fields because of the "contempt into which our staple has sunk."[103] At the same time William Beverly found his accounts on the sale of tobacco through his agents to be "so intollerable" that a continuance "to serve his Merchants . . . would render himself and family beggars."[104] Ten years later George Hume depicted the "true state of ye trade" as one in which the merchant held his goods "most extravagantly dear" and yet gave "almost nothing for tob'o." He declared the final result in all cases to be one in which "the poor man's estate is sold to pay ye merchant, both land and negroes & y't is ye end of ye poor planter & ye Merchant gets his estate for a small matter . . ."[105]

The better times of the fifties encouraged some expansion and the laying in of a greater supply of negro labor. A period of prosperity more apparent than real led the larger planters to purchase the lands of the smaller planters who had been ruined by the past years of disaster and who now moved on west and south in the hope of better returns than the old and wearied fields offered. But the

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[101] *The Case of the Planters of Tobacco in Virginia, as represented by Themselves; signed by the President of the Council, and Speaker of the House of Burgesses. To which is added, a Vindication of the said Representation.* London, 1733. (Copy in Library, United States Department of Agriculture.)

[102] Byrd to Perry, July 2, 1736, J. S. Bassett, *The Writings of Colonel William Byrd*, Introduction, p. lxxxv.

[103] St. George L. Siousatt, *Economics and Politics of Maryland, 1720-1750*, (*Johns Hopkins Studies*, Series 21, Nos. 6-7).

[104] Beverly to Perry, Dec. 8, 1742, *William and Mary College Quarterly*, III, 231.

[105] Letters from and to Geo. Hume, *Virginia Magazine of History and Biography*, XX, 409.

French and Indian War checked whatever relief had been promised and peace found the planters so hopelessly in debt that recovery was absolutely impossible. Exchange fell and payments ceased. The factor in the colonies found it dangerous to press the planter for the collection of debts and at least in one case, found it advisable to call upon the English merchants for "defensive weapons" in the form "of a pair of Pistols" that his passing through the "wooded country" might be rendered more safe.[106] Yet even the hardened factor saw that the "Tobacco makers" were reduced "to the distressed condition" in which they were so much in debt that "they were unable to pay their former balances . . . was everything they have sold to the highest bidder." And this too at a time when, according to his own statement retail goods were selling at a 200 per cent advance.[107]

So hopeless was tobacco that it rapidly gave way to other crops and ceased to hold the place which early profits, habit, developed marketing agencies, and natural advantages had given it. And the merchant stood in the eyes of the planter as the chief cause for the passing of the great staple which signified all the prosperity of the days of departed glory in the colonies.

In how far the planter's feeling toward the merchant were justified we are unable to say. His commissions often equaled the profits of the planter on the sale of a cargo of tobacco[108] and the Virginia petition of 1733 declared them to amount, on an average, to an eighth part of the total returns from the staple. It was not the open and direct commission of some 2½ per cent which offended but rather the hidden gains from "other charges," high interest on advances,[109] purchases for the planter made at too high prices, and frauds in handling the matters of duties and drawbacks. A study of such dealings is obviously out of our reach in a discussion of the soil factors as undertaken here. Yet enough has been said to show the probability of a degree of such abuses. On the other hand, the counter charges of dishonesty hurled by the merchant against the planter indicate that much was merely a matter of suspicion on both sides with enough of truth to constitute a real grievance in certain cases. Something was wrong and where fraud and oppression had been known in a few cases, the tendency was to lay the whole trouble to that cause. A study of the tobacco bills found in the papers of Col. Thomas Jones of Virginia, a typical planter of the period, will show something of what became of the admittedly low returns from tobacco shipments, and may indirectly give some idea of the portion of blame each factor in the process, including the merchant, should bear.

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[106] William Allison to Bogle and Scott, July 29, 1764, *Richmond College Historical Papers*, II (June, 1917), No. 1, 118-75.

[107] Allison to Alex Walker, June 24, 1764, *ibid.*

[108] M. S. Morriss, *op. cit.*, p. 37, from MSS, 22265, p. 102, British Museum.

[109] See *William and Mary College Quarterly*, I, 3, 224; Bock, *10th United States Census*, III, 221.

In the first place a list of the different charges made against the average shipment of tobacco, is enlightening. It included freight charges, country duties, petty charges, customs and duties (Virginia), Old Subsidy, New Subsidy, other duties, entry and landwait, light, cooperage and out charges, cartage, brokerage, warehouse rent, postage, insurance and commissions.[110] If reshipment had taken place extra charges of freight, insurance, commissions, and shipping charges would be added to those already given.[111]

A survey of the charges made against Col. Jones' tobacco from 1730 to 1775 shows that freights ran from 7 pounds as a minimum to 16 in time of European wars.[112] The average portion of the total sale price which went to pay freight charges was about 6 per cent. "Other charges" and commissions took the same per cent as freight, while the government duties and Customs required from 70 to 90 per cent of the sale price with an average of about 80 per cent. This left the planter's share at not over 8 per cent, with actual money returns of less than would pay expenses for the greater part of the period. The numerous cases of shipments that failed to pay for their own cost of shipping and selling, and increased indebtedness to the merchants after return purchases had been made, tell the story of growing disaster. Col. Jones shifted from merchant to merchant in an effort to better his sales but without success, and finally fell so deeply into the debt of Bogle and Scott that they could warn him that his "account runs pretty deep" and that he must consider this fact in making good consignments to their address in the future.[113]

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[110] Bill of Col. Thomas Jones. Shipment through Capt. Poluck, Dec., 1753, *Jones Family Papers* (MSS).

[111] See list of charges given in, *The Case of the Planters of Tobacco in Virginia. . . .* These two are very nearly the same, showing that the statement of the planters was not overdrawn in this particular item.

[112] Statements of freights in accord with these can be found in the "Letters of William Byrd," *Virginia Magazine of History and Biography*, XXVI, 132; "Letter Book of Francis Jerdone," *William and Mary College Quarterly*, XI, 158-59; Morriss, *op. cit.*, p. 37.

This case does not seem to be extreme. Daniel Dulany in 1766 said that none of the planters in the colonies had for some years past exceeded four pounds per hogshead for their tobacco.[114] Few if any were making money; many were sinking into indebtedness and ruin. Agriculture in the tobacco colonies was laboring under a load heavier than it could bear. And a part of that load came from the indirect marketing through the agency of the merchant. Here was a final factor added to those already at work to drive the agricultural methods in the colonies to their most destructive extreme. The merchant bore the charges of ruin that the combined force of many factors was producing. He had a share in them but the blame was not all his own. His part only hastened matters by adding increased pressure for economy and by offering the only well developed marketing machinery possessed by any colonial product, and thereby encouraging its continuation. In this far his influence was against the soil.

It is thus evident that the planters of Virginia and Maryland were carrying on their agriculture under heavy pressure. The single crop, the labor systems, and the methods of cultivation; the burdens of government regulations and duties; the high costs of indirect marketing and buying, together with the opportunities for fraud offered and accepted in these systems—all these forces for a hundred years and more had been tending in a single direction.

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[113] Bogle and Scott to Thomas Jones, London, July 15, 1765, *Jones Family Papers* (MSS), 1760-1770.

[114] Daniel Dulany, *Considerations on the Propriety of Imposing Taxes in the British Colonies for the Purpose of Raising a Revenue by Act of Parliament*, pp. 79-80; see *Virginia Magazine of History and Biography*, XVIII, 409, (says charges of freight and customs more than tobacco brings); J. Burke, *History of Virginia*, III, 138; *William and Mary College Quarterly*, IV, 133, (says government charges are 7/8 of charges); Address of the House of Burgesses of Virginia to King, *Calendar of State Papers, America and West Indies, 1681-1685* (King gets more than planters); "Many illustrations could be given of the exceedingly heavy duties actually levied on colonial exports at the port of London, amounting after 1750 to more than sixty per cent of their selling value," C. M. Andrews, *The Colonial Background of the American Revolution*, p. 99.

With only occasional breaks of a few years duration, the colonial planter had been under constant pressure for largest returns from his soils produced by a damaging economy and abandon. There was but one way out and that way had been adopted. The great stretches of barren and gullied fields that lay on every hand throughout the older districts offered mute testimony as to how the burden had been borne and why it could no longer be carried. A system which was possible when good lands were plenty and expansion easy, had long since ceased to operate without discomfort and was now nearing its limits. Friction, discontentment, and even conflict had begun to appear as the process slowed up and blame due to deeper causes was being attached to the various agents in the economic relationships. This was without doubt the greater fact back of the charges hurled back and forth by planter and merchant, and in part at least, back of the complaints that now and then arose against the government and its agents. Outside conditions had demanded agricultural practices that were weakening the land and leaving desolation behind as the single crop found new soils. The story is the same whether taken from the annals of the sixteenth century or from the observations made at the end of the colonial period. The difference is only one of place.

"The Virginians of the lower country are very easy and negligent husbandmen," writes the traveler Schoepf in 1783. "New land is taken up, the best to be had, tobacco is grown on it for three or four years, and then Indian corn as long as any will come. And in the end, if the soil is thoroughly impoverished, they begin again with a new piece and go through the rotation." And then, as if consciously attempting to reproduce the picture given in an earlier period by a Clayton or a Michel, he adds, "The cattle wander about in the woods and swamps to seek a meagre winter support. . . . The trouble of laying down grass and gathering feed for winter so as to keep the cattle in stalls or fold for dung, all this they regard as more irksome than cutting down trees and rooting up stumps."[115] It would be interesting indeed to know how much of the blame for this neglect should be laid to "irksomeness" and how much to habit or necessity as imposed by tobacco!

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[115] J. D. Schoepf, *Travels in the Confederation, 1783-1784*, II, 32.

Expansion because of exhaustion had begun early and in 1626 the inhabitants at Paspaheigh, whose soils Governor Dale had pronounced only fifteen years earlier to be excellent for grain, were complaining of the barren condition of their lands and asking the court of the colony for permission to move elsewhere.[116] In the same period the tenants on the public lands declared that they were unable to make a living because they had been assigned to exhausted soils.[117] A few years later (1648) the planters south of the Charles River (modern York) stated that their "lands had become barren from cultivation" and petitioned the Governor and Council for lands "still in a primeval state."[118] It is little wonder that under such conditions the forward looking father of the period found it well to provide in his will that his fields be withheld from planting so that his son might "have some fresh lands when he attains to age."[119]

Clayton in his visit to Virginia (1688) found the same practices of exhaustion and abandonment in full swing in the Jamestown district and gave unsympathetic ear to the complaints of his host to the effect that the lands were so "worn out . . . that they had not ground all together that would bring forth tobacco."[120] In 1702, Michel describes the constant "breaking of new ground" and the passing of tobacco at the head of a succession of crops ever into the forest, leaving grounds behind "that will bear no more."[121] A few years later (1724) Hugh Jones speaks of the "old fields" produced by abandonment,[122] and a generation later Philip Fithian, a tutor on the Carter Estate, tells of the opening of new lands as the old and exhausted fields are turned out to become "a common to be destroyed by winter and beast."[123] Just before the Revolution the author of *American Husbandry* gives a picture of the taking of "successive crops . . . till the land will produce no more, then leaving it fallow . . . and (serving) fresh ground in the same manner."[124] At the close of the Revolution, John Schoepf, traveling from Fredericksburg to Richmond was astonished to see "so much waste" and so much "new cleared ground,"[125] and J. P. Brissot de Warville crossing the west shore of Maryland five years later tells the same story.[126] At the end of the century, Isaac Weld in passing from Port Tobacco to Hoe's Ferry in Maryland, describes a situation that must have been produced by practices begun well back in the colonial period: "The country is flat and sandy, wearing a most dreary aspect. Nothing is to be seen for miles together, but extensive plains that have been worn out by the culture of tobacco, overgrown with yellow sedge and interspersed with groves of pine and cedar trees. . . . In the midst of these plains are the remains of several good homes which show that the country was once very different from what it is now. These houses . . . have been suffered to go to decay as the land around them is worn out and the people find it more to their advantage to remove to another part of the country and clear a piece of rich land than to attempt to reclaim these exhausted plains."[127]

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[116] P. A. Bruce, *op. cit.*, I, 207.

[117] Governor Sandys to John Ferrer, *British State Papers, Colonial,* II, No. 27; Bruce, *op. cit.*, I, 231.

[118] Hening, *Statutes at Large*, I, 353.

[119] Thomas Whitlock, *Virginia Magazine of History and Biography*, V, 285.

[120] *Force Tracts*, III, "Clayton's Letters," pp. 20-21.

[121] Journey of Francis Louis Michel, *Virginia Magazine of History and Biography*, XXIV, 30-31.

[122] Quoted by N. F. Cabell, *DeBow's Review*, XXV, 205.

[123] *Philip Vickers Fithian, Journal and Letters, 1767-1774*, p. 140.

Such a process of agriculture required an abundance of land for each planter and furnishes a key to much that was fundamental in Southern life. Expansion became the normal condition. Growth from small to large units and movement from old to new regions, are characteristics that marked the development not only of Virginia and Maryland but much of the remaining South of pre-Civil War days. The press for room was ever great. "Hence" explains Michel,[128] "the inhabitants do not live close together and the country is not settled in villages, because every twenty or thirty years new ground must be broken."

In the first place, therefore, exhaustion played a part in the development of the large estate. Tobacco indeed required "elbow room" and as the only cash crop, gave great advantage to those who could in the face of hardships secure the quantity and quality which new lands gave. The land grants and transfers of the seventeenth century are not exceptionally large,[129] but the large grant was on the increase and the small transfer often indicated the sale of the small holding to the great planter. The story of almost every successful tobacco grower's estate was one of continual expansion. The rent roll for 1704 for the region of Virginia south of the Rappahannock shows some 450 families who owned from one thousand to ten thousand acres. Many of the estates ran from eight thousand to twenty thousand and one in every four families held land ranging from five hundred acres up to this limit.[130] In Maryland the early grants were large, averaging nearly 1200 acres, but after 1650 the heavy quit-rents cut them down to tracts of two hundred acres and less in some decades and an average of 304 acres in the last decade of the century.[131]

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[124] *American Husbandry*, I, 264-65.

[125] *Travels in the Confederation, 1783-1784*, II, 25.

[126] *Travels in the United States of America*, I, 371-73.

[127] Isaac Weld, *Travels through the States of North America, 1795-1797*, p. 107. See also description of waste tracts in Northern Neck of Virginia, pp. 116-17.

[128] "The Journey of Francis L. Michel," *The Virginia Magazine of History and Biography*, XXIV, 31-32.

The eighteenth century saw the large estate grow even larger and the great planter assume an even more dominating position in agricultural production. Maryland's heavy quit-rents still operated against large holdings but a system of leasing enabled the large owner to engross lands and pay his rents. The tenants often exhausted the lands leaving them "impoverished and untenantable" but overbalanced this by clearing the timber from the ground. Holdings of a goodly size became common. In the period from 1749-60 the holdings in the various counties averaged from 255 acres to 472 acres for the small holders and the lands of such families as the Dulaneys, Carolls, Dorseys, Bennetts, Lloyds, etc., ran well into the thousands. The example of a William Cummins who made an estate by ten different purchases ranging from 25 acres in size to 150 acres, indicates how growth was being accomplished.[132]

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[129] L. G. Tyler, in *The South in the Building of the Nation*, V, 30-31; J. C. Ballagh, "Introduction to Southern Economic History; The Land System," *American Historical Association Report, 1897*, p. 116. See "Rent Roll for 1704." appendix, Wertenbaker, *The Planters of Colonial Virginia;* C. P. Gould, *The Land System of Maryland, 1720-65* (*Johns Hopkins Studies*, Ser. 31, No. 1, 31-59).

[130] "Rent Roll," Wertenbaker, *op. cit.*, appendix. See also P. A. Bruce, *American Historical Review*, April, 1923, p. 552.

[131] C. P. Gould, *op. cit.*, p. 65-68.

In Virginia the large estate grew rapidly. In the press for economy, the advantage, especially after the wide introduction of slavery, was all on the side of large scale production. The great planters took over the lands of the smaller owner who had been ruined by the low price of tobacco and the tide water peninsulas tended to be monopolized by the larger owners.[133] Each negro was thought to require fifty acres of land and each overseer was expensive unless he had at least twenty negroes under him. The thousand acre tract of arable land was the smallest unit suited to economical production. To this must be added timber areas to furnish new lands and still farther reaches for the range of the neglected herds of cattle.[134] Between 1695 and 1700 there were seven patents for from five thousand acres to ten thousand acres, and in 1726 alone grants of from two thousand acres to forty thousand became common.[135] And most of these grants were to men who already held lands. By the middle of the century estates of over a hundred thousand acres were not unknown. Most planters shared William Fitzhugh's willingness to purchase whatever available lands they thought "convenient" and a few were not averse to the use of means somewhat questionable to add to their already extensive holdings.[136] The story of the rise of the estates of the Byrds, Joneses, Fitzhughs, Masons, Washingtons, Carters, Lees, Epeses, Beverlys, Allens, etc., is one of continual additions by government grant, head rights, or purchases from individuals. The motives were of course various, but one ever in the background was the want of timber and elbow room for future agricultural expansion. On most of these estates we have the record of lands

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[132] C. P. Gould, *op. cit.*, pp. 65-68, 70-80. *Maryland Archives*, XIV, 204; VI, 38; *Scharf Papers, Maryland Historical Society*, (box 84). *Maryland Gazette*, July 9, 1752.

[133] U. B. Phillips, *Plantation and Frontier*, I, Intro., p. x.

[134] J. C. Ballagh, in *The South in the Building of the Nation*, V, 153; *American Husbandry*, I, 216-48.

[135] L. G. Tyler, in *The South in the Building of the Nation*, V, 50-51; J. S. Bassett, *Writings of Col. William Byrd*, Intro., p. x.

[136] Fitzhugh to Mr. Hayward, Jan. 30, 1686, *Virginia Magazine of History and Biography*, II, 28; J. S. Bassett, *Writings of Col. William Byrd*, Intro., p. xxxiv; C. P. Gould, *op. cit.*, p. 18-21.

"somewhat cultivated" being left behind as planting was pushed on into new areas.

But easy and unhampered expansion had its limits. The supply of "best lands" was limited in the older regions and a steady growth of population checked free movement. Someone had to emigrate to make way for the widening estates of those who remained. Thus while some by their "very handsome houses, gardens, and improvements about them," were "fixed to one spot," others "when they exhausted their grounds," sold them and moved "backwards with their negroes, cattle, and tools, to take up fresh land for tobacco . . ." "This is common," says the author of *American Husbandry*, "and will continue so as long as good land is to be had upon navigable rivers; this is the system of business which made some, as long ago as 1750, move over the Alleghany Mountains."[137]

Back of the alluvial soils of the tidewater river valleys, the soils were "thin and sandy," "of middling quality," and "quickly exhausted." Washing away, they exposed "at a depth of three or four inches, a sterile subsoil." The ridges were clay and sand and "always poor." Tobacco culture was therefore largely limited to the bottom lands.[138] Farther inland the rich river valleys became narrower and the wider uplands somewhat more fertile. But the fertility was not uniform, varying with the underlying rocks and giving little prospect for long continued tobacco planting. As the Piedmont was reached the general fertility was greater than the highlands of the coast but often produced "only a coarse staple tobacco, not much in demand at even low prices."[139] Such conditions of soil set limits to expansion for tobacco growing.

Furthermore, the population of Virginia and Maryland increased steadily throughout the sixteen hundreds with rather rapid growth, especially in Virginia, about the middle of the century. By 1700 the two colonies had a combined population of some 100,000. The first half of the next century saw a more rapid increase and then a period after the French and Indian War to the Revolution of "almost incredible growth." By 1750 the popula-

[137] *American Husbandry*, I, 216-48.

[138] "Henry's Map of Virginia," *William and Mary College Quarterly*, XIV, 856.

[139] *10th Census (U. S.)*, III, 196.

tion stood well over 250,000 and by the Revolution it had gone upward to nearly 800,000. It is interesting to note that about 40 per cent of this in Virginia and 30 per cent in Maryland was negro population and that the proportion remained at about this same level during the entire eighteenth century.[140]

This increase could only mean that lands were being widely occupied and that more food was required to feed the people and more manufactured goods required for their wants than ever before.[141] More land must be used for producing foodstuffs at the very time when the pressure for the output of the export staple was increased. Lands rose in value[142] and the care-free expansion was brought to a halt. The old life could not longer be maintained without serious friction and changes to a new order had to begin. Those who moved "outward" and those who now began the cultivation of worn out and once abandoned lands were both beginning to make the required readjustments.[143]

The westward and southward migrations were of course the product of other forces besides the demand for fresh soils. Yet the engrossing of the better lands by the great planters of tobacco, had a part in pushing the poorer and less efficient producers back from the rivers onto the ridges or westward away from navigable waters and into self-sufficing farming. They ceased to grow tobacco and yielded the standard of living based upon that exchange. They learned with William Nelson "that we can make many things for ourselves, and that we can do very well without many other things that we used to indulge in. I now wear a good suit of cloth of my son's wool manufactured, as well as my shirts, in Albemarle, my shoes, hose, buckles, wig, hat, etc., of our own country, and in these we improve every year in quantity as well as quality."[144] A line was being drawn between tobacco and self-sufficing agriculture, between east and west, between uplands and lowlands. And the line was social as well as economic.

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[140] F. P. Dexter, *Proceedings of American Antiquarian Society*, V, 22; P. A. Bruce, *op. cit.*, scattered references under "population."

[141] Bulk of land grants made in counties as follows: Elizabeth City, 1734; Isle of Wight, 1723; Accomoc, 1722; York, 1734; Warwick, 1737; Gloucester, 1738; King and Queen, 1756; Middlesex, 1720; Richmond, 1718; Prince George, 1705-18; King George, 1722-49; Caroline, 1728-55; Charlotte, 1756-74; Fauquier, 1761-76; Goochland, 1728-34; Cumberland, 1751-72.

[142] In 1772, Roger Atkinson says one acre of land costs more than 100 used to cost. Also see, Hugh Jones, *Present State*, p. 61. Lands in Maryland, 1725-1765, rose from 200% to 300%, C. P. Gould, *op. cit.*, pp. 60-61.

[143] In 1818 James Madison says the first great evil of Virginia Agriculture is the cultivation of exhausted lands, *Letters and Other Writings* (Cong. ed.), III, 77.

The Virginian, seeking fertile lands, had in 1630, begun to make clearings on the York River and then along the Rappahannock and Potomac. There was a steady expansion from then on until the hard times of the last quarter of the seventeenth century caused such a great exodus that the Board of Trade in alarm ordered the Governor to investigate the causes and check its progress. The large tracts of land held by "some persons"—"most of the lands lying at all convenient" being taken up— and the low price of tobacco, were among the reasons Nicholson gave and Edmund Randolph in a later report repeats the same.[145] This flood of emigration ran on unchecked into the eighteenth century and the Council of Virginia ascribed it to the increased number of negroes in tobacco culture which made it hard for the poor to subsist, and sent "not only servants just free" but also "old planters whose farms are worn out,"[146] into the west.

The steady eighteenth century outward movement was swept into a wave in the forties and fifties, when "such numbers of people transplanted themselves" as would seem "almost incredible to any except such as have had opportunity of knowing it . . . from observation or credible information."[147] It continued on with varying intensity up to the Revolution filling in the lands in the western part of the states and flowing over into the bounds of Pennsylvania on the north and of the Carolinas on the south.[148]

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[144] W. Nelson to John Morton, *William and Mary College Quarterly*, VII, 26. See also "Spotswood's Letters," *Virginia Historical Collection*, I, 71; See also, *Calendar of State Papers, America and West Indies, 1693-1696*, pp. 519; *ibid., 1710-1711*, pp. 430-31.

[145] *Calendar of State Papers, America and West Indies, 1696-1697*, pp. 420, 546.

[146] *British Public Record Offices*, CO5, 1359, pp. 20-22; CO5, 1362, pp. 374-82, quoted in Wertenbaker, *op. cit.*, p. 145.

[147] Ann Maury, *Memoirs of a Huguenot Family*, p. 431, "At Bedford Court House in one week it is said, near 300 persons passed to Carolina, and by October, 5,000 more had crossed the James on their way." "From the waters of the Potomac, James River and Roanoke, on the eastern side. . . . nay from the side of the Blue Ridge, hundreds of families have within these few months past, removed. . . into other governments;" *Calendar of State Papers, America and West Indies, 1696-1697*, p. 546, "The low price of tobacco has obliged many of the planters to try their fortune elsewhere."

That the exhaustion of the soils was in part back of these movements is shown by the decline of tobacco growing in the older sections and the development of new tobacco centers farther west and south. By the middle of the eighteenth century a new center had developed around and south of Petersburg. "Perhaps it may not be generally known," writes Roger Atkinson, "but there is more Land and more good land . . . . on ye south side of James River than there is in all York or James Rivers besides. . . . Whenever any tob'o is wanted . . . I mention these things . . . because you do not seem to understand the situation of this place, for when Mr. Lyonel Lyde was here, . . . there was but ab't 2,500 Hhds. bro't to these warehouses, whereas now in a common year ye Quantity is 10,000, so amazing is the increase."[149] And three years later he again writes that they are making 20,000 Hhds. "of upland Tob'o . . . upon ye best and freshest Lands." He expects this region to produce in less than five or six years a third of all the Tobacco in Virginia, since "it declines below on ye old wornout Lowlands where they can make none without manuring & that too little and at too great Expense."[150] And his prophesy was more than fulfilled, for though the older regions held to tobacco in as far as possible, and the northern Piedmont to a degree followed the same course, the great center of tobacco growing continued to the south of the James long after it had lost its hold in the other sections.

The lowering standard of living which attended the decline of a fertility that would profitably produce tobacco under its external burdens, has already been noticed. Early statements of families once prosperous, "now reduced to rags and all the visable marks of poverty,"[151] are accompanied by others of the reduced comforts given to servants and slaves or enjoyed by the poorer classes.[152] The number who could live well by tobacco culture grew less. "The people being disappointed of the necessary supplies of clothing in return for their tobacco," writes Gov. Spotswood, "found themselves under the necessity of attempting to clothe themselves with their own manufactures. . . . This is now become so universal that even in one of the best counties for tobacco, I am creditably informed that there has been made this last year above forty thousand yards of diverse sorts of woolen, cotton and linnen cloth."[153] And the reason for this situation is later supplied from "Henry's Map of Virginia," in which he says that most of the men and women of the lower classes wear cotton clothes summer and winter, "not wholly from choice," but because "they are obliged to it," as the balance of trade has for many years been against them.[154] In the darkest period just after the French and Indian War, when the planters were "exceedingly behind," with little prospect of ever being clear even though they sell a goodly part of their lands and servants, they, "out of mere Necessity," turned to the manufacture of their cotton, woolen, flax, and leather goods, hoping thus to escape the "impending ruin of the Plantations."[155]

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[148] Joseph Doddridge, *Notes on the Settlement and Indian Wars of the Western Parts of Virginia and Pennsylvania*, pp. 99-100; M. S. Morriss, *op. cit.*, pp. 9-10, in 1695 Governor Nicholson complained to the Duke of Shrewsbury that on account of the scarcity of land young men were leaving Virginia and Maryland, "where land is grown scarce to be taken up by reason of the great tracts that single persons have, and will not part with but at unreasonable rates."

[149] Roger Atkinson to Lyonel and Lyde, Esq., "Letters of Roger Atkinson," *Virginia Magazine of History and Biography*, XV, 347, letter dated Aug. 25, 1769.

[150] *Ibid.*, XV, 352-53, letter dated Aug. 25, 1772.

Another readjustment required was the production of other staples to supplement tobacco in exchange or to furnish food stuffs for the increasing population in the colonies. Tobacco yields were growing less as new lands failed and poorer or once used lands were planted. By 1700 the quantity of tobacco produced per individual in Maryland was already reduced by one-half[156] and in

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[151] See Note 82, p. 0.

[152] *American Historical Association Report*, 1892, p. 66; *Virginia Magazine of History and Biography*, II, 264-66.

[153] "Spotswood's Letters," *Virginia Historical Society Collections*, I, 71; see also, *Calendar of State Papers, America and West Indies, 1693-1696*, p. 519; *ibid., 1710-1711*, pp. 238, 430-31.

[154] *William and Mary College Quarterly*, XIV, 86.

[155] *American Historical Association Report*, 1892, pp. 66-67; William Allison to Alexander, May 21, 1765, *Richmond College Historical Papers*, II, No. 1, 118-175.

[156] M. S. Morriss, *op. cit.*, p. 25. Yet totals remained nearly level.

Virginia, in spite of heavy increases of slave labor used almost entirely in the tobacco fields, the export, after the first few years of the eighteenth century, remained at a surprisingly steady level.[157] Under such conditions, many a planter followed the course of the one whose 57 slaves produced him only 27 hogsheads of tobacco—"not enough to clean their teeth"—and turned to the production of other crops which had a food value on the plantation itself.[158]

Early experiments with flax, hemp, etc., were tried by those who had "resolved on a cessation of tobacco" and wheat had been grown in the colonies in varying amounts ever since the beginning.[159] But the heavy turning away from tobacco fell to the middle of the eighteenth century and after. Some turned to "Indico;" others to hemp, flax, or cotton; but the greater number to the increased production of wheat and corn.[160] By 1741 John Cole was able to buy wheat in Virginia for exportation to the value of 1,500 pounds and by 1770 Roger Atkinson could call "ye article of wheat" a "kind of second staple" and predict that in a little time it would be equal to if not superior to tobacco.[161] In 1771 wheat was a ready money article in Virginia and in a few years it had become so important that rents were quoted in terms

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[157] Virginia exports in pounds:

1702	36,747,192	1714	29,248,366	1754	45,722,000
1704	34,664,639	1745	38,232,000	1755	42,918,300
1709	34,467,005	1747	37,623,000	1756	25,606,800
1711	28,100,265	1751	42,032,700	1758	22,050,000

1760-75 about 55,000,000 average

R. A. Bock, *10th Census* (1880), III, 212; Jacobstein, in *The South in the Building of the Nation*, V, 158-59.

[158] J. C. Ballagh, *The Letters of Richard Henry Lee*, I, 54.

[159] In 1627, Abraham Piersey had 200 acres in wheat. Under Harvey in the 1640's both wheat and corn were sold in Maryland, Manhattan, the Carolinas, etc. Bruce, *op. cit.*, I, 301, 329, 337; *Virginia Magazine of History and Biography*, XV, 115.

[160] William Allison to Alexander, May 21, 1765, *Richmond College Historical Papers*, II, No. 1, 118-75; In 1765 George Washington was convinced that "some article must be substituted for tobacco" and inquired of the general price one might expect for good hemp in the European markets, *Writings of George Washington* (Sparks ed.), XII, 260; *Calendar of Virginia State Papers*, I, 259-60.

[161] *Virginia Magazine of History and Biography*, XV, 115, 350; Mitchell, *The Present State of Great Britain in North America*, pp. 156-57.

of wheat.[162] In the three years from 1763 to 1766 the Upper James River district exported 102,145 bushels of wheat, 3,535 barrels of flour, and 159,490 bushels of corn. In Maryland the Ellicotts were raising wheat and encouraging their neighbors to do likewise. Their flour mill was but one of the many that were rising along the streams of both states.[163] From 1768-1770 Maryland shipped 810,460 bushels of wheat to Europe,[164] and the trade in this article with the West Indies had been of considerable proportions since the middle of the century.[165] Before the Revolution, Virginia and Maryland were annually exporting some 1,200,000 bushels of wheat and only a slightly less amount of corn.[166]

The contemporary saw in this shift from tobacco to wheat and and corn a close relation to the exhausted condition of the soils. Jefferson ascribed the change largely to the fact that the "fresh and fertile" soils of the West kept tobacco at so low a price that the manure necessary for production could not be profitably applied to the worn out soils of the East.[167] It was because of "worn out grounds" that corn and wheat were now cultivated, declared the author of *American Husbandry*,[168] and Jacob Schoepf ascribed the increased values of land in Virginia to the fact that wheat was being grown on lands too exhausted to bear tobacco.[169]

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[162] "Letters of Robert Pleasants," *William and Mary College Quarterly*, I, 2nd series, 113.

[163] *Virginia Magazine of History and Biography*, I, 97-99; Sheffield, *Observations on Commerce*, p. 75; *Maryland Historical Society Publications*, IV, 10-28.

[164] *Ibid.* Also, *Commerce of Rhode Island*, I, 171, *Massachusetts Historical Society Collection*, 7th Series, Vol. IX.

[165] "Observations in Several Voyages and Travels in America," from the *London Magazine* for 1746, quoted, *Farmer's Register*, V, 81-85; Mair, "Bookkeeping Modernized," *William and Mary College Quarterly*, XIV, 87; C. P. Gould, *Money and Transportation in Maryland, 1720-1765* (*Johns Hopkins University Studies in Historical and Political Science*, Ser. 33, No. 1), p. 14 *et seq.*; F. L. Benns, *The American Struggle for the British West Indies Carrying Trade*, p. 7.

[166] Tench Coxe, *A View of the United States of America*, p. 87.

[167] Thomas Jefferson, "Notes on Virginia," *The Writings of Thomas Jefferson*, III, 271.

[168] *American Husbandry*, I, 216-48, "But the planters, none of them depend on tobacco alone, and it is more and more the case, since the grounds have begun to be worn out."

[169] J. D. Schoepf, *Travels in the Confederation, 1783-1784*, II, 44.

The growing of wheat in Maryland alone kept the ruined tobacco planters from "seeking for more fertile soil in Kentucky"[170] and it was because wheat could be produced upon the "poorest lands" that one writer thought a new day was about to dawn for the old tobacco regions.[171]

Many other changes, both material and social, attended the shift from tobacco to wheat—the break up of the plantation into farms, a new attitude toward slavery, and especially the beginning of the use of fertilizers and the use of new crops for restoring fertility to the soil. But these made only beginnings in colonial days and may well be considered with the later periods in which they reached larger proportions. One final change in which exhaustion played a part will be considered—the relations with the mother country.

The developing English policy and its general object of benefit to the treasury and the home merchants, together with the burdens which it placed upon colonial agriculture, have already been described. We have seen production under that policy become more difficult as the conditions of fertility spending upon which it rested reached its limits. The old relations which determined this policy and the agencies which carried on the actual trade had already begun to chafe and cause hardships. The merchant and the planter had become bitter toward each other; the merchant was "cursing the planters continually" while every honest planter felt that he had been "got by a merchant."[172] Complaints had long been made against the government regulations and duties and with the increasing pressure from exhaustion these burdens grew more serious.

Perhaps it was the rich lands beyond the mountains that gave the planters of the exhausted Northern Neck of Virginia their great interest in the French and Indian war and filled them with anger toward the mother country when the Line of 1763 closed them to immediate settlement.[173] But the trouble ran deeper than this.

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[170] *Maryland Historical Society Publications*, No. 4, pp. 10-28.

[171] *Virginia Magazine of History and Biography*, XV, 352, Atkinson to Lyonel and Lyde, August 25, 1772.

[172] L. S. Wrath, "A Maryland Merchant and his Friends," *Maryland Historical Magazine*, VI, 213.

[173] So stated by Ambler in, *Sectionalism in Virginia*, pp. 12-13. See also, *Political Essays*, pp. 245-46; Mitchell, *op. cit.*, pp. 58-59.

The ideal colony under the British Colonial system was one in which the "colonists wear not a rag of their own manufacturing, drive not a nail of their own forging, cast not a platter or cup of their own making, nay, the farmer produce not even the bread which he eats."[174] They should live merely by agriculture, producing a staple for export.[175]

To live such a life in the tobacco staple section, it was estimated that each planter must have from 40 to 50 acres of land for each laborer, for in no other way could the fertile soils necessary for tobacco be maintained. Each laborer could tend about five acres and each tract of land cultivated would last from three to four years before it was abandoned. Allowed to return to timber, the exhausted lands would regain a degree of their lost fertility in about twenty years and thus be ready for use again just as the last of the original tract was being exhausted by cultivation. True, the land cleared for the second time would lack some of the productiveness of new lands and some decline would result, yet with this quantity of land the evils of exhausting cultivation would be reduced to a minimum and the system be indefinitely prolonged.

But by 1760, if not earlier, such conditions no longer existed. The planter's lands did not average, according to Mitchell's estimate, more than from 10 to 20 acres per laborer, and the lowering fertility was thus forcing the colonists into a life far from the ideal which has been pictured.[176] The colonies whose staple had been tobacco, were rapidly turning to a system of general husbandry and as the means of exchange grew less, were beginning to add manufacturing as an essential part of diversified production. A process had begun that would lead ultimately to a self-sufficing life.

At the time when each white person in the West Indies was taking an average of twenty pounds export annually from the mother country, Virginia and Maryland were taking less than one pound per head.[177] One writer estimates that if the colonists had purchased even all their clothing from England the total of their imports would have been doubled.[178] Another declared that the American colonies as a whole were not securing one-sixth of their necessaries from Great Britain (1767) and that Virginia and Maryland were more and more adding their part to this figure.[179] Government statistics show a balance of trade in favor of Virginia and Maryland from 1700 to 1773 of 8,155,363 pounds, but this balance had been largely gained in the earlier years and had been growing less and less until after the French and Indian War it ran against the colonies. Furthermore, this balance does not take into account the large importation of slaves, which if added, alter the figures considerably. Sheffield, including this item, finds unfavorable balances as early as 1720 to 1730 and only slight favorable balances for the later decades.[180] Yet it is very probable that Sheffield's figures on slave importation were entirely too low. Purchases of slaves from other sections and the constant smuggling in of slaves from abroad made exact statement difficult. In 1711 Governor Spotswood declared the country already ruined by the importation of slaves—debts having been contracted that could not be paid off in years[181]—and two years later "Henry's Map of Virginia" estimated the value of slaves in the state at over six million pounds sterling.[182] Just how many of the 15,000 to 20,000 slaves that were carried by British vessels to the colonies from 1713 to 1753 came to Virginia and Maryland, it is impossible to say.[183] We do know that the negro population, with presumably a higher mortality due to their new life, did hold its own with the increase of whites throughout the century, and that the purchase of slaves was one of the reasons given for the colonial debts. At any rate the importation was large and must be included in striking a balance between the imports and exports of the colonies. Estimates vary but conservative statements seem to indicate that the planters of the two colonies were in debt to the extent of some 2,000,000 pounds at the outbreak of the Revolution.[184] And conditions were getting worse instead of better.[185]

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[174] *Political Essays*, p. 328.

[175] Wynne, *British Empire in America*, II, 381-82.

[176] Mitchell, *op. cit.*, p. 136. He says that the colonists were producing on their lands only one, and in some cases only one-half, a hogshead of tobacco where they formerly made three, p. 176.

[177] *Political Essays*, p. 263; McPherson's *Annals of Commerce*, III.

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[178] *Ibid.*

[179] Mitchell, *op. cit.*, p. 136 *et seq.*

[180] Sheffield, *Observations on Commerce*, p. 232. He states that in 1769 some 6391 slaves at 40 pounds each were brought into the colonies at a cost total, of 225,640 pounds.

[181] "Spotswood's Letters to Board of Trade," 1711, *Virginia Historical Collection*, I, 52; *Calendar of State Papers, America and West Indies, 1710-11*, pp. 416, 430, 431.

[182] *William and Mary College Quarterly*, XIV, 85.

[183] E. L. Bogart, *Economic History of the United States*, p. 63. Between 1699 and 1707 there were 2290 negroes imported into Maryland, J. T. Scharf, *History of Maryland*, I, 377.

In how far these conditions contributed to the already strained relations between colonies and mother country it is hard to say. The colonists were being forced through an agricultural readjustment that carried with it wide social changes. The government's policy was constructed and operated upon the basis of an agricultural life that had broken down under the weight of that policy. The burdens of that policy could not be borne without suffering and ultimate ruin in the face of increasing population and limited exhausted soils. There was ample room for complaint.[186]

To what extent the people laid the blame on the government or in how far they vented their wrath at the hapless agents of the system, such as merchant or shipper, we do not know. But certain it is that agrarian disaster was ever present to form a great background of discontentment and unrest upon which the more immediate disputes developed.

The close of the colonial period found the process of agriculture by soil exploitation and abandonment well extended to its limits. Some had escaped its consequences by emigration; others had yielded to necessity and changed their ways of living and methods of agriculture to lower levels; a few—and a very few indeed—had turned their attention to the fundamental problem which the combined action of frontier, markets, and government had created, and were making futile efforts to restore the soil to a new degree of fertility. With these few lay the future.

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[184] *William and Mary College Quarterly*, XIV, 85-86; XXVI, 151.

[185] *Richmond College Historical Papers*, II, No. 1, 118 (Wm. Allison's letters, 1764-1773).

[186] It should be noted that the Revolution found its staunchest supporters in the new wheat section whose scanty markets lay in the western hemisphere and whose planters needed a free hand in establishing a new economic life of their own.

CHAPTER III

THE POST-REVOLUTIONARY PERIOD

1776–1820

The Revolution does not form a distinct dividing line between an old and a new agricultural life in Virginia and Maryland. The bond between the colonies and the English nation had been broken but much that belonged to the colonial period went on unchanged. Furthermore, the efforts toward a reclaiming type of agriculture on the part of the few who remained on the old lands, and the emigration of the thousands who sought fresh lands in other parts—the two most noticeable things which were to characterize the new period—had already begun in colonial days as forced products of the old system and its breakdown. The removal of the government duties and restrictions, and the substitution of new relations in the old markets, constitute almost all that might be called a break from the old agricultural life. The war itself acted as a powerful force in bringing disaster to much that was already on its way to ruin, and gave added impulse to many of the changes already begun. But it did not introduce much that was new. Tobacco was never again to hold the place it had once occupied but the spell it held over the minds of men was not entirely broken. Foodstuffs had increased, but the facilities for handling these and steady markets for them had not developed. The future was still filled with a good deal of uncertainty.

The next fifty years were to see the old exhausting methods still widely employed. A better understanding of the agricultural ills was coming but real improvement awaited steady profits. European conflicts gave intermittent periods of prosperity and waves of reform arose to die away with the subsiding profits. On the whole the old methods shaped under the burdens of a frontier-colonial regime were now generally continued in the wider reaches of the interior and in the new agriculture that had been forced upon the older sections. But the forces that compelled them were in part different.

Tobacco, it will be remembered, had possessed the only well developed marketing agencies and the only satisfactory markets of colonial days. Habits of long standing did not change easily and the English factor and the English merchant returned with peace to carry on the limited tobacco trade in much the same old manner.[1] But tobacco was a doomed crop in the old regions and the burdens which it bore had not lessened to allow new methods or greater profits. Its advantages, great as they were, did not overbalance its disadvantages. Yet, on the other hand, so great were the difficulties encountered by other products, that when tobacco prices rose there was a rapid return on all sides to the old staple. Tobacco as the cash crop was often the lesser of evils for many years more.[2]

The reason for this is not far to seek. At the end of the Revolution, England closed the West Indies to American trade and laid heavy duties on vessels in her other ports. Yet so great was the force of natural advantage here that trade ran on heavily in her direction. And the basis of that trade had for nearly two centuries been tobacco.[3] A steady market could be found for this staple even though profits were low. And this was more than could be said for grain, for until the period of the Napoleonic wars the grain trade with England never assumed great proportions, and even then it labored under serious difficulties.[4]

France early gave commercial advantages, but was herself a heavy producer of grain and other foodstuffs. At first the monopoly held by the Farmers General on the tobacco trade was a serious burden but by its withdrawal in 1791, a rather restricted opportunity was opened for leaf tobacco. Heavy duties were charged for importation and trade never equaled the hopes early entertained. Yet some trade was possible.[5]

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[1] *Writings of James Madison*, II, 244-46; *Writings of Thomas Jefferson*, IV, 155, 188-89; *Robert Carter Papers* (MSS), 1794-97, Letter of Jan. 6, 1794, etc.

[2] *Robert Carter Papers* (MSS), *Letters and Letters to*, 1797-98, G. Carter to R. Carter ". . . the high price of tobacco has induced me to make a few hogsheads next year." *Writings of Thomas Jefferson*, VII, 309, to John Taylor, Nov. 26, 1798: "The high price of tobo. which is likely to continue for some sort time, had tempted me to go entirely into that culture. . . ."; *Farmer's Register*, I, 232, 290, 337. Note also influence of wheat rust and Hessian fly in causing a turning back to tobacco from wheat.

[3] C. R. Fish, *American Diplomacy*, pp. 59-62; F. L. Benns, *The Struggle for the British West Indies Carrying Trade, 1815-1830* (*Indiana University Studies*, X, 56).

[4] W. F. Galpin, "The American Grain Trade to the Spanish Peninsula, 1810-1814," *American Historical Review*, XXVIII, 24.

Other treaties were made by the young republic, but new openings for the grain trade awaited the continental wars ushered in by the French Revolution and its exploiter, Napoleon. As far as Europe was concerned tobacco still met as steady a market as could be found and its chances for profits were as great as any other crop under normal conditions.[6]

The West Indies trade, as allowed, was not great and was to expand only with the European conflict, while the South American flour markets were to develop with the Indies as a stepping stone. Neither, as yet, offered great outlet for grain from Virginia and Maryland.

Nor were there markets at home. The cities were small and with the exception of Baltimore, were not growing rapidly. And it was a trade whose origin was in part outside the borders of the state that accounted for the growth of Maryland's metropolis. Richmond, Virginia's largest city, had in 1800 only some 5,737 population. Some grain went out to Philadelphia and New York, perhaps for later export, but it was not of such proportions as to form the basis of a new agricultural life.

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[5] J. M. Callahan, in *The South in the Building of the Nation*, V, 381-92; Thomas Jefferson to John Jay, Jan. 2, 1786, *Writings of Thomas Jefferson* (Ford Ed.), IV, 117-30; Jefferson to James Ross, May 8, 1786, *ibid.*, p. 216. In this connection the monopoly of Robert Morris in purchasing tobacco for France should be noted. K. M. Rowland, *Life and Correspondence of George Mason*, II, 316. Efforts of Fenwick, Mason and Co., Bordeaux, to form a company to carry on trade between France and the United States. See letter of Mason to his brother under date of May, 1789, May 20, 1790, p. 326; see also letters of Hooe and Harrison to French firms under date of Sept. 26, 1791, and Oct. 7, 1791: "The prices you quote for Tobacco are encouraging but the low course of Exchange & difference of duty paid by American Bottoms added to the unsettled State of Policies in France prevent many shipments that would otherwise take place from hence. . ."; ". . . a sudden Revolution might put it out of the power of the richest & most honorable to comply with their Engagements. . . .", *Letter Book*, Feb., 1789, Oct., 1796 (MSS).

[6] *Writings of James Madison*, II, 64-67, to Jefferson, Aug. 20, 1784, ". . . Notwithstanding the languor of our direct trade with Europe. . . . the price of our last crop of Tobo. . . . has brought more specie into the country than it ever before contained at one time. . . ."

Added to the advantages in European markets was the fact that at home practically all the internal improvements that had been developed in colonial times were those necessary for the limited transportation required by tobacco. It had been produced on waters navigable to ocean going vessels or had been "rolled" over poor roads and causeways to convenient wharfs. Some improvement had been made as more distant lands were put to tobacco but even then the old practice of rolling the hogsheads to the wharfs was continued over distances of from thirty to forty miles.[7]

Both colonies had left the construction of roads, the building of bridges, the maintenance of ferries, etc., to the counties or to the private individuals whose interests led them to undertake the task. The assemblies had been at best only the general directing agents for the work which in Virginia was left to the county surveyor under the direction of the county court, and in Maryland to the county overseer, neither of whom received any salary for services.[8] Neglect in constructing and failure to keep in repair after construction, were thus combined with the failure to secure a system suited to colonial-wide purposes.[9] Each county did its work largely with purely local interests in mind and often failed to cooperate with neighboring counties toward the larger interest of the colony as a whole. Some steps to improve conditions had begun before the Revolution but war brought these efforts to an end and left the problem of a system of internal improvements to the future.

The post-Revolutionary period is, therefore, introduced with the old familiar complaints against the tobacco merchant. Madi-

[7] *Prince George (Md.) County Court Records*, Aug., 1746, Liber FF, p. 6, 178; March 1744, Liber CC, p. 294.

[8] *Hening Statutes at Large*, I, 199, 269, 436; II, 12, 103; III, 392 ff.; IV, 53-55, 229 ff., 296; V, 31, 175; VI, 64, 137; VII, 156, 577; VIII, 152, 192, 252-53, 542-43, 546, 548-9, etc. See P. C. Gould, *op. cit.*, Chap. VII, pp. 122-170.

[9] P. A. Bruce, *op. cit.*, I, 420. See petitions for improvements, *Journal of House of Burgesses*, 1761-65, pp. 207, 267; 1766-70, pp. 57-58, 100, 109, 253, 259; 1770-72, pp. 126, 233; P. C. Gould, *op. cit.*, pp. 133-34; *Virginia Magazine of History and Biography*, IX, 239-40, "Letters of Col. Wm. Byrd, 1735; *Force Tracts*, III, No. 12, p. 14.

son declared that Great Britain never more completely monopolized the trade in colonial times nor was it ever more profitable to the merchant and ruinous to the farmer. He charged the merchant with opposing the Port Bill in order that he might continue his "most visable and shameful frauds" and force the Virginia planter to lose fully fifty per cent in the selling and buying of his goods.[10] The old story of credits extended to entice the planter into debt so that his crops might be demanded is retold with the assurance that "an instance of a man's getting out of debt who was once in the hands of a tobacco merchant" is still to be discovered.[11] The Scotch merchant continued to oppose the traders from other countries and consigned those who dared to enter the field straightway "at the devil"— a process evidently highly effective if we may judge from the failure of the French and other groups to establish themselves in the states.[12]

But the tobacco crops were coming largely from the newer lands of the Piedmont and painfully finding their way to points of shipment over miserable roads or along much obstructed streams. Lower Virginia and Maryland had turned largely to corn with only "small and indifferent crops of wheat and tobacco," leaving the upper regions as the center of a tobacco production that was accompanied in most places by an equal and increasing effort toward the making of wheat.[13] Georgetown had become the great market for tobacco grown in the counties bordering the Potomac in both states and Washington, Frederick, and Montgomery counties in Maryland, and Berkeley, Fauquier, and Fairfax counties in Virginia, were heavily engaged in furnishing this market with its growing export.[14] Central and southern Virginia sent their crops down to Richmond and Petersburg, using both river and roads, from whence it was carried by lighters to Norfolk for shipment.[15] Norfolk was the great port for tobacco exports from all Virginia south of the Rappahannock. The older points of shipment which had been based upon the tidewater tobacco were rapidly declining,[16] and steps were already being taken to improve both the Potomac and James riverways into the interior in order to lighten the burden of the long shipments from the new sources of production.[17]

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[10] Madison to Monroe, June, 1785, *Writings of James Madison*, II, 146-48. Madison to R. H. Lee, July 7, 1785, *ibid.*, II, 149-52. The Port Bill aimed at restricting trade to certain designated ports in order to develop a direct trading method within the states. See Madison to Jefferson, Aug. 20, 1784, *ibid.*, II, 64-67.

[11] Madison to Jefferson, March 8, 1786, *ibid.*, II, 224-31; *Ibid.*, II, 244; Madison to Monroe: ". . . The people have got in debt to the merch'ts who set their own prices of course. . . . "*Ibid.*, II, 236-39; Thomas Jefferson to Mrs. Paradise, Aug. 27, 1786, *Writings of Thomas Jefferson*, IV, 288-89," . . . It is the most delusive of all snares. The merchant feeds the inclination of his customer to be credited till he gets the burden of debt so increased that he cannot throw it off at once, he then begins to give him less for his tobacco and ends with giving him what he pleases. . . ."

[12] K. M. Rowland, *Life and Correspondence of George Mason*, II, 316.

[13] General Edward Carrington to Alexander Hamilton, Richmond, Oct. 4, 1791, *William and Mary College Quarterly*, I, 2nd series, 139-40.

Agriculture had apparently returned to old lines, yet lacking old advantages, when the coming of the French Revolution and the wars occasioned by its spread, opened new opportunities for the Virginia and Maryland planters. Markets hitherto closed, opened in the West Indies and in Europe, and tobacco was rapidly abandoned for the production of wheat.[18] Georgetown lost its tobacco trade and failed to capture the Potomac shipments of grain which went on to Alexandria and Baltimore for foreign exportation. Norfolk made the change and her wheat and flour shipments to

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[14] George Washington, *Letters on Agriculture, Letters from His Excellency George Washington to Arthur Young and Sir John Sinclair* (Letters from Farmers in these counties.) A Montgomery County writer declares that Georgetown is the best market in the state, "perhaps in America," for tobacco.

[15] Duc de la Rochefoucauld-Laincourt, *Travels in North America*, II, 85. Charlottesville tobacco sold at Milford or Richmond and paid a freight of 1/3 of a dollar per hundredweight, *ibid.*, 6-8.

[16] *Ibid.*, II, 21-22, "Yorktown carries on no trade, but the inhabitants say that forty years back it was the emporium of all Virginia."

[17] In 1784, Virginia and Maryland gave a charter to the Potomac Company to improve navigation on the Potomac and in 1785 the James River Company was given the same right on the James. See W. F. Dunaway in *Columbia University Studies in History, Economics, and Public Law*, V, No. 2, 104.

[18] R. Harrison to Wm. Bingham, Alexandria (Va.), Dec. 21, 1789: ". . . The high prices now going for wheat and flour will make Farmers of many Planters . . .," *Hooe & Harrison Letter Book, 1789, Feb. 16, 1796, Oct. 11*, (MSS); *ibid.*, to Thos. Fitzsimmons, Dec. 3, 1789: ". . . It appears to us that all the world is after wheat. . . ."; *ibid.*, to John Cadman, April 15, 1789; . . . "Tobacco has got down to 14/ . . . as our Planters are declining the Business very rapidly. . . .; *ibid.*, to John Vaughn, Dec. 5, 1789: ". . . At this time the waggoners get a dollar per Bushell fast as they can bring in their Wheat. . . ."; *ibid.*, Mayne & Co., Jan. 26, 1790, ". . . (Wheat) prices beyond the bounds of prudence. . . . "

Europe, the West Indies, and to Northern ports rose more rapidly than her tobacco declined.[19] Richmond milled her flour in increasing quantities but could not keep pace with the flood of wheat that poured in from the west with the rising prices, and wheat grown in the interior of Virginia found its way from Norfolk to the mills on the Brandywine or other northern rivers.[20] Mills sprang up in the interior and the three counties of Augusta, Rockbridge, and Rockingham, established "upwards to one hundred mills" in the space of three or four years, and "adventuring farmers" came from far and wide with their "batteaus loaded" with grain. Baltimore became a milling center of large proportions and drew wheat from all parts of Maryland, from the Valley in Virginia, and even from the neighboring fields of Pennsylvania.[21]

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[19] Laincourt gives Georgetown's exports as follows:

1791......	314,864	1793......	364,537	1795......	196,790
1792......	348,539	1794......	128,927	1796......	159,868

"The diminution of the culture of tobacco is one of the causes for the decay of its commerce. In 1792 it exported 9,444 hogsheads and in 1796 no more than 2,461," *Travels in America*, Duc de la Rochefoucauld-Laincourt, II, 332 *et seq.*

In the mean time Alexandria's exports rose from $381,242 in 1791 to $812,889 in 1793 and $1,100,000 in 1796, *ibid.*, II, 339.

Baltimore's rose from $1,576,588 in 1791 to $3,084,545 in 1793 and $8,500,000 in 1796, *ibid.*, II, 341.

The export of tobacco from Norfolk has, by the diminution of the culture of that article, been reduced above one-third, *ibid.*, II, 10. For increase of wheat trade, see *ibid.*, II, 1-8, 10.

[20] *Ibid.*, II, 9; *The Jefferson Papers* (MSS), Vol. 79, No. 13711, to Wm. Diver, Nov. 26, 1792; Vol. 83, No. 1435, Mch. 16, April 6, 1793: ". . . a large foreign demand for our flour has suddenly sprung up. . . ." Price given at 120 cents; Thomas Zuell to Jefferson, ". . . Not less than 3000 barrels of flour carried from Milton this spring. . . ." ". . . The prospect of wheat is greater than ever known in this county," *ibid.*, 88, 1514; *Hooe & Harrison Letter Book, 1789, Feb. 16, 1796, Oct. 11*, especially, to Rey & Brandenburg, Feb. 19, 1790; to John and Thos. Manson, Aug. 6, 1790; to William Foster, Dec. 5, 1792 (Alexandria).

[21] *The Jefferson Papers*, Vol. 83, No. 14760, R. Gambel to Thos. Jefferson, May 10, 1793; F. E. Rutter, *South American Trade of Baltimore* (*Johns Hopkins University Studies in Historical and Political Science*, Ser. 14, No. 9); J. Duncan's, *Travels through Part of the United States and Canada in 1818 and 1819*, I, 235; Jared Sparks in *North American Review*, XX, 123, "In 1825 there were sixty mills within a radius of 20 miles of Baltimore;" *Richmond Enquirer*, Feb. 2, 1820.

A slight decline came in the wheat and flour demand during the latter half of the 90's and tobacco enjoyed a period of renewed planting, but it was only temporary and after 1800 its importance was always secondary. The wars in Europe encouraged tobacco planting there to a small degree and the pressure for revenue caused heavy duties to be laid upon American shipments. As a result, tobacco growing in Virginia and Maryland settled down to a lower but steady level, which, with a few periods of revival, was to be maintained until western competition worked its changes in the later decades.[22]

Meanwhile flour and wheat continued their checkered careers. A new demand came from England and the West Indies for a short period at the turn of the century and the general slump ended rather abruptly with the renewal of the European struggle in 1803, yet the check had been sufficient to prevent any great changes in agricultural methods and the markets now opened were never free from the uncertainty, danger, and restrictions incident to war or the limitations imposed by the United States as an abused neutral.[23] Nevertheless, the call for grain was large and a heavy flow of exports continued to the West Indies, the Spanish Peninsula, or to England until the peace of 1815.[24] Means both fair and foul were used to gain access to the markets, and embargoes, prohibitions on trade, etc., only added to the speculative character of the undertaking. American flour and wheat flooded the English markets as early as 1807 and a goodly share of this came from the ports of Virginia and Maryland. Alexandria, Baltimore, Richmond, and Norfolk all poured out great quantities of grain and flour as the fields behind them turned more and more to wheat. Nor did our own declaration of war bring this trade to an end. In one week in 1812, 20,000 barrels of flour left Richmond,[25] and from September 1st till December 23rd of the same year, one Virginia firm exported more than 30,000 barrels.[26] When the British fleet blockaded the Chesapeake in 1813, vessels with over 40,000 barrels of flour on board were held up in the port at Alex-

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[22] Meyer Jacobstein, in *The South in the Building of the Nation*, V, 163-64; *Niles Weekly Register*, March 24, 1827; Wm. Fowle & Co., *Letter Book, 1828, Oct. 17, 1829, Dec. 31* (MSS). This firm was handling tobacco on a commission basis out of Alexandria and their dealings reveal the status of the trade for the period indicated. See especially letters to Stephen Girard, Oct. 20, 1828; Oct. 24, 1828; Nov. 15, 1828, etc.

[23] W. F. Galpin, *Grain Supply of England During the Napoleonic Period*, Chap. VII, pp. 135-50 gives a splendid account of the Anglo-American grain trade during this period; *Lawrason and Fowle Papers*, especially *Letter-Book 1806, July 24, 1809, April 9* (MSS), to Dillaway, May 23, 1806, ". . . Our flour dealers are mad or something worse. . . ." (paying such high prices); to Dillaway, May 27, 1806, they report the fall in prices due to the rains breaking drought and the sudden rise on receipt of news of "Prussian War;" competition for grain shown in letter to Taber and Son, April 30, 1806, to Quincy & Holland, Nov. 12, 1806; Faxon, Metcalf & Co., *Letter-Book, Dec. 21, 1811, March 6, 1813* (Alexandria), to Chas Eruinelt (?) Feb. 8, 1812, ". . . We do nothing of late in the way of shipping flour to the eastward—think it too hazardous to hold much, while too much doubt and uncertainty exists relative to the course that will be practiced by our Rulers. . . .;" *ibid.*, to Andrew Clopper, Feb. 24, 1812; to Baxter, Feb. 29, 1812, and March 2, 1812.

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[24] American exports of grain and flour, 1800-1815, to England, Spain and Portugal.

	England	*Spain*	*Portugal*
1800	725,527	2,550	5,333
1801	2,977,201	11,079	43,612
1802	646,554	59,409	85,784
1803	878,654	144,935	122,410
1804	34,808	109,906	54,648
1805	107,806	103,646	22,633
1806	639,248	19,196	91,273
1807	2,006,920	39,842	76,352
1808	105,654	30,449	41,761
1809	1,383,028	40,047	65,149
1810	786,889	144,439	88,696
1811	144,779	396,047	529,105
1812	92,189	381,726	557,218
1813	842	430,101	542,399
1814	12	221	4,141
1815		67,866	47,163

W. F. Galpin, "The American Grain Trade to the Spanish Peninsula, 1810-1814," *American Historical Review*, XXVIII, 24-25, Oct., 1922.

[25] W. F. Galpin, *American Historical Review*, XXVIII, 27 ff. Note rise in price from $6.25 a barrel in August, 1812 to $10.50 a barrel in Sept., p. 28. April, 1813, it was $6. In 1803, the James River Co. charged toll on 170,588 bu. of wheat and 58,183 barrels of flour coming from interior Virginia, W. F Dunaway, *op. cit.*, p. 32 ff. In 1817, Morris Birbeck says 200,000 barrels ot flour yearly had been exported through Richmond, *Notes on a Journey in America*, p. 15.

[26] *Ibid.*, p. 37; Faxon, Metcalf & Co. to Baxter, Feb. 29, 1812, ". . .People are shipping great quantities to Europe at this moment."

andria alone.[27] The European wars had opened a new outlet to the produce of this section and a trade, precarious but rich, had rapidly developed. But it was a trade and a resulting prosperity based on war, and now peace was everywhere at hand.

The years following peace in Europe and at home were hard ones for Virginia and Maryland. European and West Indies markets closed to wheat and as the ravages of the Hessian fly were added to falling prices, the old hopeless shifting from one crop to another began again.[28] By 1821 Norfolk, the great port for tobacco and wheat, was described as a place of "grass grown streets and deserted wharfs."[29] Peace had put an end to the trade which for a period of time had given agriculture its greatest opportunity since early colonial days. Under such conditions the lure of the West where fresh soils were being sown to tobacco and farther south to cotton, acted with great force upon the older sections where agriculture languished and slaves became a burden to their impoverished masters.[30] By 1820 these states, as far as a permanent agriculture was concerned, were to a large degree back where they had been at the close of the Revolution.

Nor had agricultural methods greatly changed. Neither the early years of tobacco growing nor the later years of greater wheat production had offered wide opportunity for improvement in the methods of crop cultivation. Tobacco bore most of its old burdens, while the uncertain and shifting character of the grain trade had rendered it too speculative to allow widespread changes of a sound and permanent nature. Periods of prosperity alternated with periods of stagnation and while this process was producing deep and fundamental changes it was not everywhere introducing a new and complete type of soil saving agriculture. A few planters were enabled to make some improvements and favored sections had introduced temporarily new and better ways, but the great majority held to the old course.[31]

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[27] *Ibid.*, p. 42.

[28] *American Farmer*, VI, 4-5. Notes the return to tobacco and disastrous results: "Distress spread almost universally throughout Va. in 1818 and 1819. . . Most of the shippers were severely crippled and many of them entirely ruined. . . .Some of the first families were reduced to a state of extreme embarrassment and distress." Markets were glutted for tobacco, 1818, 1820, 1821, 1822. But even at this the production less than before the Revolution, *Niles Register*, Mch. 24, 1827; *Farmers Register*, II, 612-14. Men sell slaves to feed rest.

[29] *American Farmer*, IV, 41.

[30] "Most of our intelligent planters regard the cultivation of tobacco in Maryland as no longer profitable and would almost universally abandon it if they knew what to do with their slaves," *Niles Register*, March 24, 1827.

The statement of both planters and travelers for the period from 1785 to 1820 bear witness of the continuance of exhausting cultivation, of wasted lands, abandoned fields, neglected stock, and shifting crops. The occasional exception, though on the increase, was only more conspicuous because of his surroundings. In 1791 George Washington at the request of Arthur Young the noted English agriculturist, made a survey of conditions in northern Virginia and Maryland. In spite of the fact that Washington himself and many of his friends were making efforts at improvement, his report indicates the widespread continuation of old methods.[32] Summarized, it reveals (1) a steady cropping of lands in tobacco followed by Indian corn with ever lowering yields; (2) the general absence of meadows and stock with only here and there an exceptional farmer making use of manure to prolong the fertility of his lands; (3) and everywhere a tendency to abandon tobacco under the pressure of necessity in favor of wheat. It is of interest to notice that the average yield of wheat is given at little more than ten bushels to the acre, and that in many cases the returns were as low as seven bushels. One is inclined to agree with Washington in his questionings as to whether such methods deserved to be called "a system of agriculture."[33]

The Duc de la Rochefoucauld-Laincourt crossed both Virginia and Maryland in 1795-96 and recorded rather minutely his observations on agricultural methods.[34] Passing along the tidewater he found the farms too large for good cultivation, the cattle "poor and ill favored" and always in the woods; the fields generally planted in corn, never manured, and in sixty miles of travel around the city of Richmond not a single field that was even "tolerably" well cultivated, though as he added, his journey took him over the very poorest part of the country. Going westward he found Jefferson at Monticello attempting much needed reforms in a region of generally poor farming, and crossing into the Valley of Virginia was more favorably impressed with the soils, the fields of timothy and clover, and the increased supply of stock. Going northward down the Valley the fields were more extensive and better cultivated, and the whole landscape assumed an appearance of wealth. In western Maryland where tobacco was "reduced to almost nothing," the general conditions continued to be of a higher type but the results of tobacco were still to be seen and the ground was never plowed more than two or three inches deep and never manured. As he moved eastward again, conditions became poorer and the old practice existed of planting land in corn the first year, "then wheat for six or seven years without interruption, or as long as the soil will bear any," then fallow while another piece of ground was cleared and "also exhausted in its turn."

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[31] An agricultural awakening had been produced by the prosperity of these years (that will be dealt with later), but it had not been widespread nor touched the great masses of common farmers.

[32] *Letters on Agriculture, Letters from His Excellency George Washington to Arthur Young and Sir John Sinclair* (reports from farmers).

[33] *Ibid.*, p. 16, Letter of Aug. 6, 1789.

[34] *Travels in North America*, II, 1-356.

Turning southward down the East Shore of Maryland he found conditions at their worst. The land "drained by long growth of tobacco" was "poor and barren." The few farmers encountered who possessed a knowledge of better methods allowed "custom to prevail over light" and hindered by the great expense entailed by a change to better methods, followed the "common routine." Emigration, lowering values in land, and soils untreated with manures produced a condition "inferior to almost all the other states of America."

Four years after Laincourt had visited Albemarle County, Virginia, a new settler described the country as a "scene of desolation that baffles description—farm after farm . . . worn out, washed and gullied, so that scarcely an acre could be found in a place fit for cultivation." The lands had been "butchered" by the growth of tobacco and even in 1799 there was not a good plough in the entire county. Conditions were so bad that the inhabitants had to make the choice between emigration at once or improvement without delay.[35]

The next year William Strickland visited the two states and declared that he could not discern how profits could be derived from such crops, unless, that the people being actually possessed of the soil and of the slaves to cultivate it, abandoning all expectation of interest for their capital, looked upon all as net profits that was received from the land.[36] He probably needed to be told as did Arthur Young, that the matter of preserving the land did not enter into the question, since it was cheaper to wear out a piece of land than to preserve it. But it is worth noticing that the man who had given that explanation was at this very moment bending his every effort toward the introduction of a new system on his lands that had as its first and greatest object the restoration of the fertility to his soil.[37] Strickland found the owners of land in the two states in poor circumstances, and the lower classes in absolute wretchedness. The old ruling class had sunk with declining fertility and a new "equality of poverty" had come as the less opulent and less intelligent rose to power with the sinking of their former superiors. Virginia had, in his estimation, reached "the lowest state of degradation" as far as agriculture was concerned, and Maryland was little better.[38]

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[35] *Farmer's Register*, I, 150, Letter of John H. Craven.

In 1816, James K. Paulding described the land in the vicinity of the James River and in fact the greater part of lower Virginia as "generally impoverished" by "being planted without its strength being sustained by manure"[39] and three years later W. Faux in going from Baltimore to Washington saw no good land—all seeming "exhausted, worn-out, rusty, and hung up to dry, or rather bake in the sun."[40] In 1819 both sides of the Chesapeake in Maryland are described as "dreary and miserable in aspect"—"dreary and uncultivated wastes, a barren and exhausted soil, half clothed negroes, lean and hungry stock, a puny race of horses, a scarcity of provender, houses falling to decay, and fences wind shaken and dilapidating," are the terms used by the traveler.[41] A few better farms and farmers were now and then to be found in the region but they stood out against a general background of ruin.

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[36] Wm. Strickland, *Observations on Agriculture in the United States*, p. 45.

[37] *Writings of Thomas Jefferson*, VI, 81-82, 82-83.

[38] Wm. Strickland, *op. cit.*, p. 45. Corn and wheat taken from soil as long as it will produce. Tobacco taken till land exhausted, then grain.

[39] James K. Paulding, *Letters from the South*, p. 96-97.

[40] W. Faux, *Memorable Days in America*, p. 99. See also, *A Tour in America, in 1798, 1799, 1800*, by Richard Parkinson, I, 98-99; also, *Address to the Agricultural Society of Maryland*, Dec. 15, 1819, Virgil Maxey; also, *American Farmer*, I, 330; *Farmer's Register*, I, 232.

[41] Agricola, in *American Farmer*, I, 99. See also Virgil Maxey, *op. cit.*; *American Farmer*, I, 330.

In the same year farmers in Essex, King and Queen, King William, Prince George, and Caroline Counties in Virginia, were still turning their fields out to the "care of Providence . . . after working them down to utter sterility," allowing them to grow up to pine and cedar and then burning them off for a second exhaustion. In Amelia County "gullied fields interspersed with broom straw and stunted pines" were everywhere to be seen, and there were "no meadows, no luxuriant fields of clover, no rich crops of grain, no large and fat cattle, and indeed nothing that indicates good husbandry."[42] In the most upper counties of the Valley conditions were still poor and though their lands had not been so exhausted as in the older parts of the state, "yet many . . . had been run down and few were improved."

It should be noticed that these writers in the later years have described conditions in regions least touched by the prosperity, shifting as it was, that had come with the production of grain for foreign export during the period of the Napoleonic wars. The regions here described are those whose lands had so long suffered under the old methods of tobacco cultivation that they were largely unfit for wheat or whose situation was such as to give them a poor outlet to markets. They include the tidewater sections of both states, which it will be remembered did not to any great extent produce wheat; interior counties of the Piedmont whose transportation facilities did not allow profitable shipment of wheat or whose soils were not responsive to clover in rotation; or the counties located so far down the Valley, as Bedford and Rockbridge, that transportation charges largely consumed the profits on the limited quantity of produce that could be gotten to market. Of course the line cannot be drawn sharply, and not all of these regions were backward nor were all others progressive, yet it is true that old methods more completely held sway in these parts than elsewhere.

When one turns to the counties in western Maryland, such as Washington, Frederick, and Montgomery, or to certain valleys in the northern portion of the state, he finds decided contrasts. There enough prosperity had come with the foreign demand for wheat and flour to enable leading farmers to begin improvement. Not all joined in the effort but enough to give a better general appearance to the sections. And the same was true in those portions of Virginia where wheat had found its opportunity. Loudoun, Fauquier, portions of Culpeper and Albemarle, etc., in the interior, and most of the upper Valley, all presented an improved appearance.[43] Where opportunity had offered, men had begun to change the old ways. Their number was not great but the future was theirs and their efforts must be rather carefully followed.

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[42] *Richmond Enquirer*, Aug. 20, 24, 27, 1818; July 20, 1819; July 13, 1819; May 30, 1820; *Farmer's Register*, I, 232.

The significant fact in the efforts of these reformers was that they all started with the purpose of improving the soil as the first step toward advancement. If the efforts and statements of those who most keenly saw the agricultural situation before them is any indication of the fundamental problem of agriculture in these states, there is no question but that it was one produced by the depletion of the soil and removable only by the restoration to the soil of a degree at least of its original fertility. At this point all the men who aimed at improvement began. And their successes and failures reveal rather clearly the forces which conditioned agricultural changes in the two states.

The earliest agencies of the new agricultural life were the owners of great estates. Well back in colonial times a few exceptional planters had carried on experiments and attained some success. The great shift from tobacco to wheat had come about largely from such beginnings. But the great period of effort belongs to the Post-Revolutionary times and was the work of a group already well known in the public life of the new states. Their efforts consisted not only in changes of method and crops but also in the organization of Agricultural Societies and the production of an agricultural literature. Working individually but constantly exchanging ideas by letter or through the press, such men as Washington, Jefferson, Madison, John Taylor, J. M. Garnett, etc., formed what might well be called a school of gentleman farmers who had run counter to the general backward drift.

But there were lesser and less widely known men who followed in the train of the great planters who pushed boldly out toward change. Especially in western and northern Virginia and Maryland, men largely unknown to the political world carried forward an agricultural work of equal importance and often of a more enduring character. Israel Janney, John Binns, F. Tilghman, W. C. Nicholas, Philip Tabb, John Minge, Fielding Lewis, John Shingleton, and numerous others, many of whom were of Pennsylvania German descent, both by example and precept taught the lessons of a better agriculture amid a tendency to drift or follow the old course of destruction.

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[43] *Richmond Enquirer*, June 2, 1820, Aug. 13, 1819; *American Farmer*, I, 330. The correspondence of Washington, Madison, Jefferson, etc., is filled with agricultural improvement in this period and reference will be made to some of their works later. Improvement followed the rivers rather closely and those counties on the rivers all showed a degree of awakening.

Washington early established his reputation as a progressive agriculturist.[44] In him the transformation of the planter into the farmer is well exemplified and his efforts at improvement include nearly all of the things attempted in this period. He had begun his work of improvement well before the Revolution and resumed it immediately upon his return to Mount Vernon with the coming of peace. When in 1786 he called upon Arthur Young in England for assistance in his new undertakings, that honorable gentleman, casting aside the feelings engendered by the late war, was moved to reply, ". . . The spectacle of a great commander retiring in the manner you have done from ye head of a victorious army to the amusements of agriculture, calls all the feelings of my bosom into play and gives me the strongest inclination . . . to endeavour . . . to contribute to the success of so laudable a measure." Hailing Washington as a "brother farmer" he offered him "men, cattle, tools, seeds, or anything else" that might contribute to his success.[45]

Washington was among the first to understand the importance of good plowing as a means of preserving fertility. In 1769 he tested the value of plowing the earth into ridges as compared with harrowing it out flat as a method of checking the harmful effects of erosion, and during the remainder of his life never ceased his fight against this ever threatening danger.[46] He filled his gullies with old rails, trash and straw, covered them with dirt and manure before planting them with crops, and when he found that the cultivation of corn induced erosion he was ready to abandon it regardless of the inconvenience it entailed in feeding his slaves.[47] Ever on the lookout for "any kind of a tool or implement" that would improve his cultivation, he secured both at home and abroad new types of plows and strove to increase the depth of his plowing as a means toward increased fertility and as a way of preventing the heavy washing attendant on shallow cultivation.[48]

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[44] P. L. Haworth, *George Washington, Farmer.*

[45] Arthur Young to George Washington, Jan. 7, 1786, *Papers of George Washington* (MSS), 1785-86.

[46] *Diary of George Washington*, J. M. Toner Copy (MSS), VI (1769), 509-10.

Realizing the impossibility of improvement upon large units of land he was among the first to cut his estate into smaller tracts and to insist upon more intensive methods by his overseers or tenants.[49] As early as 1760 at least, he was experimenting with marl as a fertilizer and in that year tested its comparative value with manure and different kinds of mud secured from the river beds on his plantation.[50] He tried out Plaster of Paris (gypsum) and in 1785 sowed his grass seed with carefully measured quantities to ascertain the effects of different amounts upon the yield.[51] The laying down of meadows and the increasing of his manure supply were fundamental in all his efforts at improvement. He planted grasses of different kinds—clover, lucerne, sainfoin, chicory, succory, etc.; he searched out and planted different kinds of cow peas and sowed buckwheat to be turned in as a green manure for the next crop of grain; he constructed sheds for his cattle so that he might "raise manure" and he sought in every way to return to his lands the offal of his barns and pens.[52]

Along with his interest in manure went the effort to increase and improve his stock. "Indifferent" sheep and cattle were culled out from his flocks and better breeds introduced as larger numbers were added. He even dreamed of the day in the not far distant future when his herds would be so increased that he could furnish the neighboring city of Alexandria with milk from his dairies.[53]

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[47] *Papers of George Washington* (MSS), Vol. 231 (1784-85), No. 31114.

[48] *Long Island Historical Association Memoirs*, IV, 6; *Writings of George Washington* (Sparks ed.), XII, 282; *The Papers of George Washington* (MSS), Vol. 237, No. 31870.

[49] *Writings of George Washington* (Sparks ed.), XII, 309.

[50] *Diary of George Washington* (Toner Copy), Vol. 3, May 22, 1760. (April 30-Oct. 18).

[51] *The Papers of George Washington* (MSS), Vol. 231, No. 31103.

[52] Washington Transcripts (Toner), *Letters from managers and overseers at Mount Vernon, 1785-99*, p. 275, Wm. Perce, Dec. 13, 1795.

[53] Washington to Perce, Nov. 2, 1794, *Long Island Historical Association Memoirs*, IV, 119.

Washington early turned from tobacco to wheat and then to the finding of a satisfactory system of crop rotation that would restore and preserve his lands. He tried fallowing for his wheat and as early as 1793 experimented with drilling.[54] His rotation system went through many changes and in the end included potatoes, several crops of clover or other grasses in succession, buckwheat as a green dressing, interspersed with the usual grain crops.[55] His instructions to his managers and tenants include the frequent laying down of clover lands, the use of plaster, the saving and use of manure with frequent turning in of green crops as a dressing to the lands intended for wheat.[56] His correspondence abounds with suggestions for new rotations and most of those which commended themselves to him received trial in the evolution of the system used at Mount Vernon. To such a farmer the term "progressive" may well be applied.

The work of Washington suggests the threefold lines along which the new movement developed among the great owners: first, the use of better plows and methods in the preparation of the soil for the crops or in the prevention of soil erosion; second, an increased interest in the production of animal manure and the use of artificial fertilizers; and third, the introduction of grass crops for feeding and green dressings as a part of different systems of crop rotation. All were more or less part of a single system of soil improvement but did not always go together and can therefore best be treated separately.

Good plowing characterized the efforts of practically every improved farmer and was the special feature emphasized by many. It aimed both at the deeper turning up of the soil and at a disposition of the furrows in such a way as to prevent washing. Tull's *Horse-hoe Husbandry* was perhaps the most widely read book on agriculture among the educated farmers of the period and it no doubt had a part in the widespread effort at better cultivation.[57]

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[54] George Washington, *Letters on Agriculture. . . .* p. 43-49.

[55] *Jefferson's Farm Book*, 1776-1822, p. 92; *Jefferson Papers* (MSS), Vol. 78, No. 13465, To Wm. Randolph, Oct. 19, 1792.

[56] *The Papers of George Washington* (MSS), Vol. 198, No. 40015, Dec. 10, 1799.

[57] N. F. Cabell, "Some Fragments of an Intended Report on Post-Revolutionary History of Agriculture in Virginia," *William and Mary College Quarterly*, XXVI, 145-68.

But the exhausted and eroded surfaces that appeared on all sides offered eloquent testimony of the need for change and many who had no knowledge of English methods early began to improve the plow and the plowing. Deeper plowing was a part of John Taylor's enclosing system and Thomas Jefferson made his contribution in a more scientifically constructed plow share. A list of the men who practiced and taught the gospel of better plowing would be long indeed, but mention should be made of such leaders as Landon Carter, John Slaughter, J. H. Craven, Thomas Moore, T. M. Randolph, Joseph Muse, Virgil Maxey, S. O. Minor, F. Tilghman, John Binns, J. H. Hasson and Joseph Desplain.

Deep plowing was an essential part of the famous agricultural system now developing in Loudoun County, Virginia, and Montgomery County, Maryland. "The improvement of this valuable machine," (the plow) writes Robert Russell from Loudoun County in 1818, "was the first step we took to improve our lands; we formerly adopted the absurd plan of shallow ploughing leaving the under stratum unbroken which should have been torn up and mixed with the surface; we have constructed our ploughs much larger and stronger, the mould boards are all of cast iron. We seldom break our land with less than three horses to a plough, which enables us to plough our ground deep. . . ."[58]

How well these men understood the benefits of deeper plowing can be seen from the writings of Thomas Moore of Montgomery County, Maryland. He called attention to the fact that the "hastily falling" summer rains turn a shallow surface to "liquid" before the pan beneath can be penetrated and carries if off leaving a hard compact surface of sterile soil behind. A deeper plowed surface prevents this by absorbing more water and allowing time for the pan below to be passed. It also gives greater root room and furnishes a more even supply of moisture to the growing plant. It affords a greater supply of available food materials and retains the manures applied longer so that lands once exhausted yield abundant returns when the lower reaches of the soil are turned up by the plow.[59]

Hillside or horizontal plowing was early introduced as a means of preventing erosion on rolling lands. Credit for its development is usually given to Thomas Mann Randolph of Albemarle County, Virginia, and to him the Albemarle Agricultural Society presented "a piece of plate with an appropriate device and inscription" for this great contribution.[60] Randolph developed a plow with a reversible share which enabled him to turn his furrow down hill "going and coming" but the invention did not find wide following though the general system of plowing around the hillsides spread over the greater part of both states.[61] As a writer in the *Farmer's Register* said, "This kind of plowing and ditching which so admirably provides against the formation and increase of gullies, constitutes one of the best means of resuscitating the exhausted soil." To this writer the great thief of fertility was the "heavy fall of water, which like a tyrannic destroyer, frequently sweeps nearly all the soil at once." With the abandonment of cross plowing and the introduction of Randolph's plan he saw the way open to a new agricultural day for his section.[62]

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[58] Robert Russell to George Jeffries, *American Farmer*, II, 5.

[59] Thomas Moore, in *Agricultural Museum*, II, 217, Feb., 1812.

The period from 1783 to 1820 saw the development of the iron plow in the place of the older wooden plow or the light shovel plow of the later period. Almost every neighborhood had its expert plowmaker and as the types differed with each maker the plowing matches of the agricultural societies offered opportunity for comparison and wider adoption of the better types.[63] Plows were in use, by the twenties, that required from three to five horses or oxen to draw them and which cut the earth to a depth of from eight to ten inches or more.[64] And it was by the means of this improvement that progressive farmers everywhere attacked the problem of restoring the "galled and butchered" lands. "To plow as deep as possible" became the rule with more than one man who faced the task of improving lands "thrown out of cultivation" and now covered with stunted pine as monuments to "the thoughtless improvidence of man."[65]

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[60] "Minute Book of the Albemarle Agricultural Society," *American Historical Association Report*, 1913, I, 299-300. In 1785 a Mr. Spindle used it in Essex Co., Va., *Farmer's Register*, II, 744; in 1804, J. S. Slaughter had used horizontal plowing in Culpeper Co., *American Farmer*, II, 14.

[61] Thomas Jefferson in *American Farmer*, II, 94-95.

[62] M. N. in *Farmer's Register*, I, 585-89; *American Farmer*, I, 330.

[63] *American Farmer*, IV, 22-23, 325, 331; II, 351; *American Historical Association Report*, 1918, I, 250, 256; Plans for a plow manufacturing plant under control of Albemarle Agricultural Society.

[64] J. S. Slaughter, in *Agricultural Museum*, II, 150-51, Nov., 1811; J. H. Craven in *Farmer's Register*, I, 150-52; *American Farmer*, II, 59.

The addition of animal and vegetable manures to the soil together with the use of artificial fertilizers constitute the second part of the improvement program. The exhausted fields of Virginia and Maryland called for outside assistance, and recovery without such aid was slow and uncertain. Few men hoped for success without their use and fewer attained it. The fundamental difficulty was a depleted soil and a fundamental step in improvement was the addition of manures and fertilizers.

Necessity had already forced the use of animal manures upon the inhabitants of the older portions of the states. Most farmers in this period were making some use of manure. With many no special effort was made toward its production or collection—the casual supply from a small quantity of stock or an occasional penning, maintaining a degree of fertility on a limited extent of ground. With the few, however, increased numbers of stock and great care in securing, preserving, and applying every particle of manure obtainable was an object of first importance. In fact, this constituted a part of practically every progressive man's efforts. It was the first step taken by Jefferson in the recovery of his lands which had been so widely cleared and impoverished during his absence abroad and in the cabinet;[66] Madison considered it absolutely necessary for improvement;[67] it was fundamental in John Taylor's system; Landon Carter, Fielding Lewis, Col. Bosley, Hill Carter, etc., made it a first object and so on down the list from the highest to the lowest who faced the future with a determination to improve their wasted lands.[68]

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[65] The almost universal statement of those who were most ardent for better plowing was that they were employing it on lands exhausted and thrown from cultivation, *American Farmer*, I, 330; *Farmer's Register*, I, 150; *Agricultural Museum*, II, 217. Cary plows were widely used and Stephen McCormick of Fauquier Co. (Va.) was making an exceptionally good plow. One furnace company in Shenandoah Co. in 1819 was making "vast quantities of iron mould boards." One Leesburg merchant ordered 300 at one time, *Richmond Enquirer*, Aug. 13, 1819; Aug. 5, 1826; Wm. Weaver manufactured 1,350 McCormick ploughs at his Bath Iron Works in the period 1827-29; Jordan and Irvine (later Jordan, Davis and Company) cut some 3,684 shares from 1828-1839. Stephen McCormick's royalties from one Benj. Blackeford on ploughs was running from $1200 to $2000 yearly around 1830; see Stephen McCormick to Jordan and Irvine, Dec. 20, 1830 (MSS letter in the possession of the McCormick Library, Chicago). [I am under obligation to Mr. Herbert Kellar of the McCormick Library for this information on Stephen McCormick, and permission to use his correspondence.]

[66] *Thomas Jefferson Papers* (MSS), Vol. 103, No. 17669; *Jefferson's Farm Book*, 1776-1822 (MSS), p. 82-83; Jefferson to J. Taylor, Dec. 29, 1794, *Jefferson Papers* (MSS), Vol. 98, No. 16740-1-2, etc.

The value of the liquids from the stable was early realized and drains from each stall were constructed by some farmers so that not a particle would be lost.[69] Farmers debated in letters, society meetings, or the press, the relative benefits from allowing manure to lie scattered over the ground with those coming from plowing it immediately into the earth. A few learned the necessity of protecting the manure pile from the rain and weather and more than one man proclaimed the doctrine "that the size of the manure pile is the measure of success in agriculture."[70]

The adding of artificial fertilizers seems to have been almost as widely practiced as was the use of animal manure. The substances tried included marl, lime, plaster or gypsum, marsh mud, ashes, sea ore, fish, common salt, and almost every kind of vegetable matter from oak leaves to pine cones.[71] Of these, special mention should be made of marl and gypsum, though the mixing of sands with clay soils and clays with sandy soils has an interest of future importance.

Marl, which was to become so important in the next period through the work of Edmund Ruffin, was tried in various parts of the two states in this period. William Short of Surry County

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[67] *Letters and Other Writings of James Madison* (Cong. ed.), III, 63-65.

[68] *American Farmer*, VI, 289; *Niles Weekly Register*, XV, 177-78 for John Taylor; *Farmer's Register*, I, 18, for Lewis; *William and Mary College Quarterly*, XXI, 11 *et seq*; *Farmer's Register*, I, 105-7, for Hill Carter.

[69] See Robert Smith's letter in *American Farmer*, IV, 81-82. Note also the relation of cattle and manure to good farming in the Valley of Virginia, *Farmer's Register*, II, 14-17, etc.

[70] It is not intended to imply that these practices were general for they were not. It was only the occasional man who acted, though there was a wider knowledge of better ways as the agricultural papers show.

[71] Objects mentioned are gathered from reading of agricultural papers of period and from a few special booklets as that of Geo. Redd, *A Late Discovery . . . relating to Fertilizing Poor and Exhausted Lands.* Redd advocated common salt as a cure-all on poor lands. See also *Memoirs of Philadelphia Agricultural Society*, II, 173-77, for Richard Peter's comment on Redd's Book.

(Va.), tried it in 1775 and Thomas Cocke of Prince George County (Va.), made a trial in 1803. John Shingleton in Maryland followed in 1805 and Richard Hall of King William (Va.), conducted an experiment in 1814. Henry Taylor and Archer Hankins of James City County (Va.), made early trials and achieved considerable success. A few others possibly made some experiments but the practice was not widespread and while Shingleton's influence in Maryland seems to have been somewhat more extensive little effect was felt in Virginia until Ruffin began his work in 1818 and thereafter.[72] The early trials are of interest largely because of the later importance of this fertilizer rather than because of any immediate consequences.

The credit for the introduction of Plaster of Paris or gypsum seems to belong to John Alexander Binns of Loudoun County, Virginia, though something can be said for the claims of his neighbor Israel Janney.[73] Binns combined with deep plowing the use of gypsum and to him and this system Loudoun County owed its rise from an "exhausted and wasted" region to the most productive county in the state. He began his work, as he tells us, in 1784 when he secured from a ship captain at Alexandria a small sample of gypsum and tried its effects upon corn and wheat. The results were marked especially on wheat and he continued his experiments in the following years with other plants. He found gypsum to greatly benefit grass plots and by its use on clover he raised a worn and exhausted farm, on which his neighbors thought he must starve, to a high degree of fertility. So marked were the effects on white clover that many thought he had collected all the manure in the countryside and applied it to the field.

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[72] See Introduction to *Calcareous Manures*, Edmund Ruffin. *Farmer's Register*, X, 656; IX, 24-25, for Hill's story; *American Farmer*, II, 115, for Shingleton; *American Farmer*, V, 387, article by "Agrestis"; *American Farmer*, XIII, 201, for influence of Shingleton. In 1824 a quantity of guano brought to the editor of *American Farmer* and received comment, VI, p. 316.

[73] Rodney True, "John Binns of Loudoun," in *William and Mary College Quarterly*, II (1922), Series 2, 20-39. Mr. True gives the credit to Binns after examining both sides of the controversy. The case is, however, not so clear as Mr. True seems to think and there will always be some doubt on the subject. See story of discovery of gypsum in *Board of Agriculture of Great Britain* by Dr. A. Frothergill and in *Syracuse Journal*, June 5, 1772, both published in appendix of Judge Peter's book on Gypsum.

After a time Binns' success induced his reluctant and scorning neighbors to adopt the use of gypsum and in a few years they doubled their corn yields and increased their wheat crops by three and four fold. Soon the granaries and mills of the community were glutted and threshing was being delayed because of the heavy yields of grain. Fields once covered with sedge and broom grass were in the course of a few years well set with red and white clover and "old fields" were bearing abundant harvests again.

In 1803 at the request of his friends Binns incorporated his experiences and agricultural ideas into a booklet entitled, *A Treatis on Practical Farming*. Here he told the story of his discovery of gypsum and advocated its use together with deeper plowing and a wider raising of red clover.[74] He showed his knowledge of other fertilizers also and indicated their comparative value to the farmer. Salt, soot, ashes, lime, straw, and various kinds of animal manure were rated and the quantity per acre required given. It is interesting to note that he was well informed as to the value of liquids from the barn yard, but that he accepted common salt as "excellent" when applied a year or two prior to cultivation.[75]

How widely this book was read we do not know. Thomas Jefferson sent copies of the work to his English friends, Sir John Sinclair and William Strickland, and commended it as the work of a simple farmer who by the practices advocated had been lifted from poverty to wealth and the county of Loudoun changed from a land "exhausted and wasted by bad husbandry" into "the most productive one in Virginia" and its lands from being the lowest in price up to the very highest.[76] At any rate, the use of gypsum spread rapidly and certain it is that in the period from 1800 to 1820 no other single factor made such great changes for the better in the agricultural life of the two states. Coming at a time when a market for wheat was open, it was widely adopted and proved its worth both directly to the wheat crop and to the grass crops placed in rotation with wheat.

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[74] "Deep ploughing is of great advantage to every kind of soil, especially the light hilly lands, the soil of which is liable to be carried off with every hard rain; it makes the soil deep; . . . it has been an idea among farmers in general, that their ploughing ought to be regulated by the depth of the soil. But my experience has taught me that the shallower the natural soil, the deeper it ought to be ploughed . . . and that this enriches the ground I have no doubt; and it brings into action a great proportion of the before buried nitrous particles of which the earth is richly supplied. . . . I am satisfied that this method of ploughing will . . . prevent any lands from washing into gullies . . . p. 45-51. "Red Clover . . . if ploughed in when about half its height . . . will act as an excellent coat of manure."

[75] *A Treatis on Practical Farming*, John A. Binns, 1803. (Copy in the Jefferson Collection at Library of Congress). A booklet of 72 pages.

The correspondence of Mr. George W. Jeffries with the farmers in different Virginia counties, published in the *American Farmer*, reveals the great transformation that gypsum worked in that state. From Amelia County, William Meriwether writes of lands once worn out and "having more and deeper gullies than any tract of its size in the country," which under clover and gypsum rose in productivity from three bushels of wheat to fifteen.[77] From Culpeper, John Slaughter tells of lands so exhausted that emigration was the only alternative to improvement, now lifted by horizontal and deep plowing and the use of gypsum on clover rotations, to the point where they produce from ten to twenty-five bushels of wheat to the acre.[78] From Loudoun, both Robert Russell and William Noland tell the story of lands "worn out by long cultivation and bad systems," unable to support their inhabitants, now in a most fruitful condition from the regeneration begun with gypsum on clover and the attendant deep plowing and the rotations made possible by clover crops.[79]

Montgomery, Washington, and Frederick Counties in Maryland also turned heavily to the use of gypsum and it was one of the factors in giving them a superior type of agriculture throughout this period.[80] In many cases from the fact that they responded to the application of gypsum, lands took on new values[81] and to many it seemed that the long sought cure for the agricultural ills of the section had been found and that a new era lay just ahead. But the greater number stood skeptically aside and awaited further trial.

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[76] Jefferson to Sir John Sinclair, June 30, 1803, quoted by Rodney True in *William and Mary College Quarterly*, II, Series 2, 20-39.

[77] *American Farmer*, II, 20.

[78] *Ibid.*, II, 14.

[79] *Ibid.*, II, 5, 59.

[80] *Ibid.*, I, 201; III, 106, 135-41, etc.

[81] See advertisements in *Richmond Enquirer*, Feb. 22, 1816, "Valuable property for Sale. This land is in good order and preservation, there being none clear in the tract that is not in good heart and cultivated in its turn. Clover has formed a crop in rotation for several years past. It is supposed there is no land in the state on which Plaister of Paris has a greater effect."

The introduction of artificial grasses was an essential part in the development of ameliorating crop rotation. Until grasses were introduced the alternate planting of tobacco, wheat, and corn, could only lead to a rapid soil depletion. All the forces of exhaustion from erosion to the removal of plant food materials had free play from year to year until a forced abandonment gave a long rest from cultivation to prepare the soil for any future crops. With the coming of grasses the way was open for increased supplies of animal manure, and the nitrogen fixing legumes themselves aided fertility by the accumulation of nitrogen in the soil. By these additions the way to continued fertility was suggested.

It is hardly necessary to list the different grasses tested by the various improvers. Jefferson, like Washington, tried out lucerne, chicory, succory, sainfoin, and various kinds of clover, and what these leaders did, other men in different parts of the states were doing also.[82] But clover was generally the grass finally selected in all regions where it would grow and clover became the legume in most rotations.

Nor can a list of the different rotations be given. They differed with almost every individual—and most individuals shifted from time to time—and ranged from the simplest three and four field shifts to the more elaborate systems that required from eight to nine years to complete their course. In the earlier years before John Taylor had published his *Arator*, the general tendency was to eliminate or reduce corn to a minimum but with his praise for that crop many gave it a higher place and attempted to build a system upon it. Wheat was quite generally the cash crop aimed at though oats, barley, and buckwheat often found a place in the systems. The famous James River four field system consisted of wheat on clover fallow, corn, wheat and clover turned in by deep plowing in the fall. Introduced perhaps by Mr. James M. Selden, it held sway at Shirley, Westover, the Brandons, etc., for several decades to the apparent improvement of the soils.[83] And from these great and fertile estates many a lesser man borrowed his ideas of improvement. In Loudoun County the system included one crop of corn, two of wheat, and three of clover. George Logan's rotation which had some followers in Virginia and Maryland, ran over a period of nine years and included corn, potatoes, and flax, two wheat crops, winter barley followed by buckwheat with clover and timothy, and two crops of clover. Logan counted on his system supporting fifty head of stock besides sheep, from which manure could be gathered to apply to the soil. He figured that the great object of any system of rotation was the preservation of the fertility and since no rotation could do that alone, manure must be produced to balance the account. He calculated that his stock could produce enough manure to annually cover one-ninth of his acreage and with a nine year rotation each plot could receive its turn and the fertility thereby be maintained.[84]

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[82] Jefferson to Washington, Sept. 12, 1790 (incorrectly dated I believe), *The Jefferson Papers*, Vol. 99, No. 16927-8 (MSS). "I must say a word to you about the succory . . . you were so kind as to give to me some of the seed . . . I consider it as one of the greatest acquisitions a farmer can have . . ." Tells of sowing with lucerne, and of feeding horses with clover. See also, *Writings of Thomas Jefferson*, VII, 9-11 (Ford ed.). "I have sowed this year about 120 acres" (of clover).

Jefferson Papers (MSS), Vol. 100, July 6, 1796, Letter of Washington to Jefferson on clover; *ibid.*, June 9, 1796, Jefferson to Washington. See also, *A Treatis on the Culture of Lucerne*, Jacqulin Ambler (see Jefferson Collection in Library of Congress).

The system advocated by John Beale Bordley was based upon the Norfolk system of England. It included three crops of clover, and one each of wheat, potatoes, maize, peas, and barley. He advocated a heavy use of manure, rich earth, marl, and ashes and contended that his system would restore exhausted fields to a new degree of fertility. "Grass," wrote Bordley, "is the great basis of Farming products; it gives dung; dung gives vigor to the earth that gives all things."[85]

A few men had also begun the planting of different kinds of field peas and had placed them in their systems of rotation.

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[83] *Farmer's Register*, I, 321-25.

[84] George Logan, *Fourteen Agricultural Experiments, to Ascertain the Best Rotation of Crops: Address to the Philadelphia Agricultural Society.*

[85] John Beale Bordley, *A Summary View of the Course of Crops, in the Husbandry of England and Maryland, 1784. With a comparison of their Products; and System of Improved Courses, Proposed for Farms in America.*

Jefferson spoke of the cow pea as being a great benefit to the soil in his neighborhood[86] and Landon Carter made it the basis of his improvements.[87] Carter especially saw the great benefits to be derived from the pea crop in preparing the ground for later grain crops, in furnishing food for more stock as a means to increased manure supplies, and more especially as a shade crop on fallow land. He conceived of plant food as coming from the soil particles in part but more from the atmosphere. Driven to an investigation of the best means of restoring lands by a degree of exhaustion that offered only an alternative of famine or emigration, he came to the conclusion that corn, as it was then cultivated, was a most harmful crop and that the direct heat from the sun was the real destroyer of the land's fertility. The air was therefore the great restorer and the remedy lay in exposing the soils to the air by better plowing and protecting it from the rays of the sun. Shade thus was an essential to recovery and shade could best be secured from the field pea. It should be noted in passing that Carter's results in practice were more satisfactory than his explanation of causes and that the importance of shade crops was to become later a matter of widespread recognition.

In the story of individual effort at improvement one portion remains yet to be told—the part played by Col. John Taylor of Caroline. Reference has already been made to his interest in deep plowing and the use of manures, but his services to the agriculture of his section were such as to merit special consideration.

John Taylor early began improvements on his estate, Hazelwood, near Port Royal on the Rappahannock River and in 1803 published in a Georgetown newspaper a series of articles on agriculture which were later (1814) reprinted in book form under the title *Arator*.[88] This work made a stir throughout the south and awakened a new spirit in agriculture in many parts of both Virginia and Maryland.[89] Tidewater Virginia was particularly aroused and

[86] Letter of Phillip Tabb to Thomas Jefferson, *The Thomas Jefferson Papers* (MSS), Vol. 100, No. 17203, Aug. 30, 1796.

[87] Landon Carter's "Crop Book," *William and Mary College Quarterly*, XXI, 15-16, 11-12, 13; XX, 282-84.

[88] *The Plough, the Loom, and the Anvil*, I, 175; *The John P. Branch Historical Papers of Randolph-Macon College*, II (June, 1908), Nos. 3 and 4, 214, W. E. Dodd, *John Taylor, of Caroline, Prophet of Secession.*

[89] Appomattox, in *Farmer's Register*, IV, 207-8.

a writer in the *American Farmer* in 1819 declared that the *Arator* imparted a new complexion to the agricultural face of lower Virginia. "In the lower part of the state," he said, "this little volume might be called the '*vade-mecum*' of almost every cultivator of the soil."[90] It was the almost universal judgement of the writers of the next period, that "the agriculture of Virginia owed more to John Taylor for valuable and enduring service than to any other individual whatever."[91]

Taylor saw clearly the real problem. "Our land has diminished in fertility," he said, "and the decay of the culture of tobacco is testimony of this unwelcome fact. It is deserted because the lands are exhausted. To conceal from ourselves a disagreeable truth, we resort to the delusion that tobacco requires new or fresh land; whereas everyone acquainted with the plant knows that its quantity and quality, as is the case with most or all plants, are both greatly improved by manured land, or land the fertility of which has been artificially increased. Whole counties comprising large districts of country, which once grew tobacco in great quantities are now too sterile to grow any of moment; and the wheat crops substituted for tobacco have already sunk to an average below profit."[92]

And having pointed out the real trouble, he indicated the first steps necessary for improvement. "It is in vain to begin at the wrong end to improve our system of Agriculture," he warned, "fertility of soil alone can give success to ingenious theories. These applied to barrenness at best resemble only the beautiful calculations of a speculator who demonstrates a mode of making fifty thousand dollars from a capital of a hundred thousand to a man worth only a hundred cents. The capital must precede the profit."[93] Or again, "It is absurd to talk of a system of agriculture without having discovered that every such system good for anything must be bottomed upon fertility. . . . To make it

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[90] Letter of a Gloucester County (Va.) Gentleman, May 23, 1819, *American Farmer*, I, 78.

[91] Edmund Ruffin in *Farmer's Register*, II, 510.

[92] *Arator*, p. 12. Taylor made an effort at measuring the exact impoverishment of Virginia's soils by a comparison of the tobacco or an equivalent produced in the earlier period with his own day. He declared that he had observed many farms for forty years and knew of their exhaustion.

[93] *Ibid.*, p. 194-97.

(the soil) rich therefore ought to be the first object of our efforts. . . ."[94]

The way to a restored fertility as understood by Taylor lay in the return of manures of all kinds, animal and vegetable, to the soil. "Manure only can recover this capital," was his declaration and he urged the undertaking of all modes of manure production and application as the one hope for recovery in his worn and exhausted section.[95] Other efforts at improvement without this as a foundation were bound, in his estimation, to absolute failure. Manure offered the one way of escape.

In practical application, many things were included in Taylor's efforts at improvement. In fact there was scarcely an evil that escaped his keen eye or scarcely a single movement toward better conditions that he did not include in his program. But the first step from which he advanced to all other things was what he called "enclosing." This was his way of practicing his doctrine that "the best system of practical agriculture" was the one offering "the best mode of raising manure." By "enclosing" Taylor meant the exclusion of all stock from the arable lands and the producing of those crops which afforded the greatest supply of offal for conversion into manure by penning, bedding, or feeding.[96] "Manure," he wrote Jefferson, "can only come of great offals, and great offals, only of great crops. These great crops, and great offals then are the desiderium."[97]

He had come to the conclusion that the great source of fertility was to be found in the atmosphere and plants alone could draw upon this supply and make it available for man to return to the earth. Plants, like animals, feed upon each other and vegetable matter must be supplied to the soil either directly or through the medium of animal manure. In some cases the direct return of the plant to the soil was desirable, but more often the better way was through the feeding of stock or the littering of their pens for the production of manure. He estimated that fully three-fourths of the vegetable matter of the earth had already been extracted and until a new supply was returned to the soil it could not produce bountiful crops.[98] Fallowing and pasturing must therefore end and in their places the cultivation of vegetable matter must be carried to the highest degree possible. Manure was the remedy and manure applied as soon as produced before evaporation had lessened its efficiency.

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[94] *Ibid.*, 68-71.

[95] *Ibid.*, 87 *et seq.*; 106-10; see also *Jefferson Papers* (MSS), Taylor to Jefferson, June 1, 1794. *Ibid.*, Taylor to Jefferson, March 5, 1795. This letter gives a splendid statement of Taylor's entire system and most of his ideas, later given in the *Arator*, are here given.

[96] *Arator*, p. 72-86; *Jefferson Papers* (MSS), Vol. 98, No. 16819, Taylor to Jefferson, March 5, 1795. It should be noted that Taylor did not exclude stock from the plantation but only from arable lands. He would develop separate meadows for his stock where "tooth and hoof" would not injure the tougher sod. Stock was essential to his system for manure, but it was to be kept off all lands intended for crops.

[97] *Ibid.*

The crop which seemed to offer the greatest advantages for use and market, and which at the same time gave widest room for the production of offal was the now much condemned Indian corn.[99] Corn furnished food both for man and beast, and its offal was abundant for the production of manure. The stock, the blades, the shucks, and even the cobs could be used as litter for the barn yard or could be plowed under in the fields as a direct vegetable manure. The evils usually charged to it were the product of the system used and not the crop raised. Corn was not an exhauster but in fact an improver. "We seek after a vegetable proper for poor ground," says Taylor, "it is found in corn."[100]

But corn was not the only means to be used for clover was to be grown on every spot where it could be "prevailed upon to exist."[101] Artificial fertilizers, as gypsum, lime, and marl[102] met his heartiest approval and deep plowing, as well as plowing in such a way as to expose the soil most to the atmosphere, was insisted upon. He recognized the difficulties encountered in plowing shallow soils too deeply but thought that with his system of enclosing, manuring, and ridge plowing in the fall, the immediate lowering of productivity might be lessened and the ultimate benefits greatly increased.[103] Nor did Randolph's system of horizontal plowing escape his notice. This as a means of preserving fertility was highly approved and urged upon his fellow agriculturists. Crop rotation, unless the sole means of improvement relied upon, also met his approval. Yet he warned against its adoption as a substitute for manure. Rotation was a means of maintaining fertility, not the means of restoring lands that had been "killed" by the successive blows dealt by those who pretended to cultivate it. If crop rotation in any way was to crowd out the more vital things, such as the constant effort toward the production and application of manure, then it held in itself more of harm than of good.[104]

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[98] *Ibid.*

[99] *Arator*, p. 87 *et seq.*

[100] *Thomas Jefferson Papers* (MSS), Vol. 98, No. 16819, Taylor to Jefferson, March 5, 1795.

[101] *Ibid.*

[102] *Arator*, p. 111-13.

[103] *Ibid.*, p. 150-52. No greater advocate of deep plowing could be found in all the period than John Taylor.

With his program for reform stated, Taylor turned his attack upon the ills and enemies of agriculture. Tobacco comes in for a rather mild rejection; the overseer system draws a harsh condemnation; the withdrawal of capital and ability from agriculture to manufacturing is bitterly noted; the evil of keeping more slaves than can be personally supervised and efficiently used is pointed out; the lax slave regulations of his section are sharply criticised; and the whole force of a full arsenal is brought to play upon the governmental burdens, especially the tariff, which rest upon agriculture.[105] In fact, as great as are Taylor's contributions toward constructive reform and progress, it is doubtful if they equal the service he rendered by his attack upon the old methods and abuses still existing in agriculture. He erred greatly in some of his explanations and theories of fertility, yet there was little to be mistaken in his harsh and telling condemnations of the old system and the ruin which it was bringing to the section he loved. As a force in awakening the men of this section to a realization of a bad situation and the need for immediate change, John Taylor and his writings stand almost alone in influence in the post-Revolutionary period. Nor were his suggestions for improvement greatly at fault. In practice most of his methods proved sounder than his theories and the results attained by following his lead were on the whole good. John Taylor of Caroline heads the list of agricultural reformers in this section until Edmund Ruffin begins his course of wider reform in the next period.

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[104] *Arator*, p. 194-97.

[105] *Ibid.*, 41-82, 232, 260, etc. His use of the cow pea, and his efforts for the wider growing of artificial grasses, and the selection of seed corn should be noted. See *American Farmer*, I, 257; II, 31; *Thomas Jefferson Papers* (MSS), Vol. 102, No. 17497-8.

The second agent to be noted in the post-Revolutionary reform effort is the Agricultural Society. Composed largely of the individual improvers whose efforts we have already noticed, these organizations offered opportunity for the exchange of ideas and carried forward a work by combined effort which was not possible to the individual in the spreading of new ideas and in encouraging new trials and means toward improvement.

The earliest society in Virginia seems to have been one organized at Williamsburg in 1774 and though subjects other than agriculture were discussed at its meetings it included the advancement of agriculture among its purposes.[106] The Philadelphia Society for promoting Agriculture, organized in 1787, numbered among its members and contributors to its "Proceedings," several men from Virginia and Maryland and acted as an influence in these two states.[107]

Talbot County, Maryland, organized a society in 1805 and declared among its purposes the improvement of agriculture in the county and among its neighbors "by communication . . . related to systems of husbandry, rotations of crops in grass and grain, the nature, qualities and kinds of soil, the improvement of every kind of soil by manures and the fit application of these to different soils and systems, the construction of ploughs and other implements of husbandry, . . . the improvement of soils by particular cultivation, and the employment of peas, beans and other pulse."[108]

Around 1810 many societies were organized in Virginia, though the movement does not seem to have reached Maryland.[109] Of these, the efforts of the Richmond Agricultural Society are particularly worthy of notice. Under date of April 7, 1810, the secretary, Mr. George Hay, issued a questionnaire which had been submitted to the society by a committee and invited general response from the public. The purpose of the move as explained in the introduction was "to collect all the practical agricultural knowledge of the country and convey it to the public in the way which may be deemed most conducive to the general welfare." Among the questions proposed for discussion the following are of particular interest to us: "1. The best mode of restoring worn-out land, filling up gullies, and bringing it in order for the plough. 2. The best rotation of crops in which Indian corn, wheat, and clover are included. 3. do. in which tobacco, wheat and clover are included. 4. do .for a sandy soil including Indian corn. 5. do. for clayey soil including wheat. 6 . . . 7. The best mode of preventing lands under the plough from washing. 8. The comparative advantages and disadvantages of the two systems, that of inclosing for purposes of excluding stock, or keeping a large stock—which will produce the greatest annual profit, and which will tend most to the improvement of the soil. 9. The best method practicable on a large scale of bringing exhausted lands into a condition to bring clover. . . ." Other questions dealt with deep plowing, use of plaster, fossil manure, marl, green crops to be turned in, producing and applying manure, management of the dairy, clover, etc. The questionnaire closed with a general inquiry as to the improvements and decline throughout the state.[110]

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[106] N. F. Cabell, "Early History of Agriculture in Virginia," *DeBow's Review*, XXV, 82-83.

[107] Wm. Embleton, Dr. Carroll, Mr. Howard, Mr. Fitzhugh, Ed. Carrington, Ebenezer Zone, G. W. P. Custis, John Taylor.

[108] *History of Talbot County, Maryland, 1661-1861*, compiled principally from the literary relics of the later Samuel Alexander Harrison by Oswald Tilghman, II, 22-29.

[109] Frederick County (Va.); Columbian Agricultural Society, (Md.); Culpeper (Va.) Agricultural Society, *Agricultural Museum*, I, 8-13, Sept. 26, 1810, July, 1810. The Virginia Agricultural Society was first organized in 1811, see A. J. Morrison, in *William and Mary College Quarterly*, XXVI, 169-73.

A second wave of society forming began around 1817 and lasted into the early twenties. The movement included first a wide organization of county societies followed in both states by the federation of the local societies into state organizations.[111] The work of these societies was very much the same and a brief survey of the activities of the Albemarle Agricultural Society of Virginia will serve to illustrate the part they played in forwarding the agricultural life of the section.

The Albemarle Society was organized on May 5, 1817, and included as did most of the other societies, many men from outside the borders of the county. Its general purpose was the forwarding of all matters of interest in the improvement and advancement of agriculture. In the list of objects enumerated in its constitution for attention and inquiry are to be found all matters pertaining to the staple and subsidiary crops of the county, the rotation of crops, implements of husbandry, most economical quantities of land, labour, and animals, the use of manures, plaster, green dressings, fallows, and other means of ameliorating the soil.[112]

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[110] *Agricultural Museum*, April 24, 1811.

[111] First general meeting of the Delegates from the United Agricultural Society of Virginia held at Parkets Tavern in Surry County, Jan. 10-12, 1820, see *American Farmer*, I, 347.

Maryland Agricultural Society formed at Baltimore on June 2, 1818, *American Farmer*, I, 54.

In practice the society gathered information on all methods of improvement, heard papers on almost every subject connected with agriculture, held fairs and plowing matches, gave prizes for improved implements, and among other things gave premiums for the best methods for recovering worn-out lands. It distributed agricultural papers to its members, attempted to establish a manufactory for farm implements under the patronage of the society, fathered a movement for the establishment of a Professorship of Agriculture at the University, and on every occasion lent its support to internal improvements which would better the markets of the section.[113]

What this society did for its county and section was in a large part attempted by the societies of other counties in the two states. The sum total of their efforts must have been of considerable importance as a force toward an increased knowledge and improved practice of agriculture.

The agricultural paper as an agent of reform needs little comment. The local newspapers quite early carried agricultural notes on different occasions and with the rise of the county and state, agricultural societies began to print their papers and addresses.[114] Mathew Carey's *American Museum* (Philadelphia, 1787) carried considerable of the material later found in the agricultural paper and much of it was of interest to the farmers of the south.

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[112] "Minute Book of the Albemarle (Va.) Agricultural Society," *Annual Report of the American Historical Association*, 1918, I, 263-349. Purpose stated on page 264-65.

[113] *Ibid.*, p. 249, 252, 274, 286, 289, 312. Action of the Society can also be followed in the *Richmond Enquirer* or the *American Farmer* for the period. Many of the papers read before the society are printed in both papers.

[114] In 1818 the *Richmond Enquirer* began publishing Agricultural notes, and the Richmond Society, Virginia Society, Albemarle Society, etc., notes and papers found there. See also *Lynchburg Virginian's* column. See private letters on Agriculture, as *Enquirer*, July 3, 1818, etc.

The first strictly agricultural paper of the section was the *Agricultural Museum* issued from Georgetown in 1810 under the editorship of the Reverend David Wiley.[115] In the first issue the editor expressed his desire to take part in that agricultural awakening which had already caused thousands of acres of waste and worn-out lands "to be clothed with rich abundance." Improvement was, however, as yet confined only to the few and "without free communication of ideas—without the means of diffusing correct principles—their operations must necessarily be retarded and their influence on the community be circumscribed within narrow limits." To fill this gap was the purpose of the *Museum*. The editor hoped it might become "the depository of valuable information . . . and the means of a free communication of sentiment and general interchange of ideas on important subjects" of both agriculture and domestic manufacture. The aim was high but the wish was hardly to be fulfilled.

John Skinner's *American Farmer* began publication from Baltimore in April, 1819, and became almost from the first issue the leading medium for the spread of agricultural ideas and exchange of opinion between both individuals and agricultural societies. It was the organ in which many societies ordered their papers and addresses to be printed and the most common recipient of the writings of those farmers who were inclined to relate their experiences or express their opinions on agriculture.

These agricultural papers not only served as a means of communication between the different farmers and societies in spreading information but also published articles of merit from agricultural writers at home and abroad. Through travel by the editors or by letters from different corners of the states they furnished information as to methods and crops. At least in one case they lent a hand in the work of restoring the wasted lands of the region by offering prizes for those who lifted exhausted lands into a new state of fertility. On the whole they were a powerful force in helping forward the new efforts that were being made toward progress in the section.

This closes our discussion of the agents in the work of reclaiming which was attempted in the period from 1783 to 1820. It should be noticed that they had mapped out and tested almost every means of reform that was to be tried in the section up to the Civil War. The soundness of much that had been attempted cannot be questioned. They were on the whole working along correct lines. Yet as we have already seen they had not made great headway toward changing the general course of agriculture. The almost unanimous opinion of the writers of the day was that the general situation was bad and that the methods of exhaustion had not been widely abandoned. The movement had not been a great success. Several questions therefore arise that must be answered. How largely had the new movement touched the great mass of farmers? What had been permanently accomplished? Where the efforts had failed, what were the reasons? And lastly, what were the general results of both the success attained and of the failure which had predominated? The answers to these questions have in part already been given but some things remain to be said.

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[115] Files of the *Museum* are found in the Library of the Department of Agriculture, Washington, D. C.

To begin with, the percentage who had taken up the task of improvement had never been great. In a few sections the number was large enough to give a general air of advancement to the entire community,[116] but as a rule where agriculture had been long practiced, a fertile farm was, as a traveler remarked, like an oasis in a desert of ruin. " 'Tis true," said Virgil Maxey in his address to the Maryland Agricultural Society in 1819, "there are scattered in different parts . . . enterprising, intelligent, and spirited individuals . . . but their example has had but little effect in reforming the habits of the country in general."[117] Nor could anything else have been expected in a section where the few lived a life quite beyond the supposed attainments of the common masses. It was customary for common men to allow these very men who now "improved" to go a solitary way in most things rather than to take them for examples to be imitated. It is not surprising, therefore, that men were slow to take up the new ideas and that the uncertainty of profits, even when the correctness of methods had been demonstrated, discouraged the first trials. So much of failure had attended agriculture that men were ever prone to question the efficiency of anything new that was offered. The skepticism of the planter towards new things, according to James M. Garnett, exceeded that of St. Thomas himself, for the planter believed nothing he heard and after seeing and feeling, was inclined to still doubt to a degree that prevented action. He cites the case of the first Cary plows sent into his neighborhood remaining in the Tavern stable-yard, an object of cunning suspicion, for a period of almost a year before anyone could be found who would even give them a trial.[118]

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[116] The Conococheague and Monacacy Valleys in northern Maryland, Frederick, Washington, and Montgomery counties in Maryland, Loudoun, Fauquier, parts of Albemarle, sections along the James, Rappahannock, and in the Valley. These had a larger share of improvers, but more who made only moderate efforts, and many who still impoverished.

[117] *American Farmer*, I, 330.

Nor did the rise of the agricultural paper greatly increase the spread of information among the mass of common farmers. The *Agricultural Museum* soon suspended publication for want of support and even the *American Farmer* within a short time found its activities greatly handicapped. It was indeed hard to get the farmers to "innovate upon their old routine of Bible and newspaper reading" which was the extent of that done by the few who read any at all.[119]

Under these conditions progress was slow and the masses remained untouched by the efforts of the few. "Let a farmer introduce an improvement in the art of husbandry and how slowly do those around him profit by his example," was the comment of one who had tried. "They look on with indifference, nay, nine out of ten shake their heads with that air so characteristic of agricultural obstinacy, and pertinaciously stick to the system which they and their fathers before them followed from time immemorial; . . . I have known a man who waited twenty years to see if plaster would make his neighbor's clover grow. Alas for the delay! When at last convinced of its utility he was grown too poor to purchase it, and his land too much exhausted to be reclaimed by its use."[120]

But the limited extent of the movement was not the greatest disaster. More fatal to ultimate progress was the fact that most of the great planters who did make the trial and who did have some temporary success were in the end doomed to failure. By the beginning of the twenties or at least by the opening of the thirties, most of the earlier attempts had ceased and faith in many of the methods tried had been shattered.

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[118] Address to Frederick Agricultural Society, Nov. 14, 1822, *American Farmer*, IV, 290-91.

[119] John Dickinson in *Farmer's Register*, I, 535-37.

[120] These are the words of Franklin Minor used at a later date but applicable here, see *Address to Albemarle Agricultural Society*, Nov. 1, 1845.

Washington found his efforts with gypsum and marl did not bring results, his soils being of a type least affected by these agents.[121] Try as he might, profits could not be made and in 1798 he declared that only the sale of lands to a very considerable amount enabled him to meet the expenses of his estate.[122] His fields continued to exhaust and to the very end of his life he was turning out old fields as "too much exhausted to be longer cultivated."[123] When he was called from his estate into the public service, his overseers refused to obey his instructions and filled his lands with Indian corn and brought his rotations to an end.[124] In 1834 a planter in the vicinity of Mount Vernon writing in the *Farmer's Register* says: "Any curious to mark the operation of time upon human affairs, would find much for contemplation by riding through the extensive domains of the late General Washington. A more widespread and perfect agricultural ruin could not be imagined; yet the monuments of the great mind that once ruled are seen throughout. The ruins of capacious barns, and long extended hedges seem proudly to boast that their master looked to the future."[125]

Nor did Jefferson's efforts meet with greater success. Against his will the "disgusting dish of politics" drew him surely from his "clover and peas," and the demands for public service soon took him from his attempted reforms. At the end of his presidency he bemoaned the fact that his whole life had been passed in occupations which kept him from any minute attention to his farms, and prevented him from acquiring anything but general ideas on agriculture.[126] The fluctuations of the markets and the difficulty of getting produce to market from his estate both hindered his progress and brought him at the end of his days to financial ruin.[127]

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[121] *Letters on Agriculture*, p. 37-8-9 (To Sir John Sinclair).

[122] *The Papers of George Washington* (MSS), Vol. 287, No. 38308, observations on Mr. Anderson's accounts.

[123] *Ibid.*, Vol. 298, No. 40019, instructions for Muddy Hole Farm, 1799.

[124] *Jefferson Papers* (MSS), Vol. 98, No. 16813-5, Washington to Jefferson, Oct. 4, 1795.

[125] F. in *Farmer's Register*, I, 552, Feb., 1834.

[126] *Jefferson Papers* (MSS), Vol. 185, No. 32919, Jefferson to T. M. Randolph, Jan. 31, 1809.

John Taylor's efforts met with little more of final success. The faults in his methods soon were apparent and the good was abandoned along with the bad. Even the ardent Edmund Ruffin found the application of Taylor's methods to give no results and gave them up in disgust. A few years later when Ruffin himself had created a new interest in reform, a friend warned him not to hope for too much for as he added, "I am old enough to remember that when the great agricultural patriarch of Virginia first published his *Arator* his opinion was in the mouths of everybody; and I was then young enough to believe confidently that all Virginia would soon be a perfect garden. But what followed? A few possessing soils primitively rich, have derived great advantages from pursuing Col. Taylor's system: fewer still have ingeniously adapted the system to poorer soils; a smaller number, residing on lands called . . . 'poor acid soils', have, by strictly adhering to the four shift system, been barely able to keep their noses out of water; while much the largest number, even of those who made the loudest noise about Col. Taylor's writings, have not obeyed a single precept contained in them."[128]

Many soon found that horizontal plowing did not prevent all the ills it had been intended for and often brought in new factors that were dangerous. A writer in 1837 declared that horizontal plowing was the main cause for the many gullies of his day and that a comparison of the date of the beginning of the gullies would show that it corresponded with the adoption of horizontal plowing.[129] Others found that deep plowing sometimes lifted a less productive soil and produced greater harm than good. Some abandoned both types of plowing, but fortunately they did not form a majority. The good in this line was never entirely lost.

Nor did the use of gypsum go on unquestioned. Binns had perhaps weakened the general soundness of his contribution by the inference in his writings that gypsum is a complete fertilizer, whereas it at best increases the supply of only three essential elements, calcium and sulphur directly and nitrogen indirectly by favoring the growth of legumes.[130] This led in some cases to the neglect of any other agents of improvement and soon to failure. It was not long before men who had once been the warmest advocates of gypsum were denouncing it as the impoverisher of their lands. Many began to look upon it as only a stimulant which urged the soil on to a more rapid exhaustion. Lands were soon being declared "clover" and "plaster sick," and many abandoned the use of both.[131]

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[127] *Ibid.*, Vol. 198, Jefferson to Mr. Gibson, April 16, 1813; May 2, 1813, (tells of effects of War of 1812 on affairs).

[128] *Farmer's Register*, I, 585.

[129] *Ibid.*, V, 180-81.

The growing of grasses lost heavily by the failure of gypsum. Many again began pasturing their fields after harvest under a so-called fallow, and "the snout, the hoof, and the tooth" again held sway on the arable lands.[132]

Even the agricultural society dwindled and in many cases ceased to exist. By the thirties a writer recalled that there had been a rage for forming agricultural societies in Virginia around the period 1819-22, and added, "Nearly all ran the same course and in a few years ceased to be heard of."[133]

The tragedy of these failures drove some to sarcasm and some to poetry. One chides the Yankees with not understanding the English language when they talk of resting land under clover. He insists that Virginia alone truly rests her lands by incessant cropping followed by grazing until the land at last comes to that complete repose found in death. "Everybody knows that nothing is at rest till it is dead," is his caustic comment.[134]

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[130] I am not quite sure that the charge made against Binns here is strictly correct. Many did rely on gypsum as the only thing necessary for good crops but Binns himself advised the use of manures and was a most ardent advocate of deep plowing. Nor did all his followers make the mistake. Robert Russell writing in the *American Farmer*, II, 5, says ." . . plaster is not a manure," and adds that its work is with clover and the grand object is manure. See *Gypsum as a Fertilizer*, William Crocker (MSS).

[131] *American Farmer*, III, 85, "The ground is getting tired of clover and the people are looking for a substitute;" *ibid.*, II, 182, Warmest friends now denounce; *ibid.*, III, 139; II, 28-30, etc.

[132] *Lynchburg Virginian*, July 23, 1829.

[133] *Farmer's Register*, I, 290.

[134] *Lynchburg Virginian*, July 23, 1829.

Another, evidently more deeply pained, "sings," of:[135]

> . . . Tillage old Virginia knows,
> Which cheats with hope the husbandman who sows;
>
> ....
>
> With crops immense, no barn here ever cracks;
> The wheat comes always badly from the stacks,
> The corn falls ever most immensely short
> Of vague conjecture or of false report;
> No well fed bullocks drag the glittering plough,
> But half starved horses, and the Lord knows how!
>
> ....
>
> No smiling pastures spread inviting here,
> But dry hot fields on ev'ry side appear.
> A sultry scene, a dismal waste, alas!
> Where man's great object is to kill the grass.
>
> ....
>
> That stupid, blind, short-sighted band,
> Who skim the surface and undo the land:
> Who rear no clover on a thirsty soil,
> For why?—it grows not to reward their toil;
> Who strew no Gypsum, but absurdly rail,
> And swear 'tis nothing to the old cowtail.
> These are the follies— these their crying sins,
> Despite the pamphlet of the enthusiast Binns;
>
> ....

As to the causes of the failures something has already been said. A few more definite things can here be noticed. Some of the land simply would not respond to treatment that could be profitably undertaken. Some had never possessed great fertility and now in an exhausted state could not be made to yield paying crops. The sooner this was discovered the better. And some had made the discovery.[136]

In some cases it was purely a case of unwillingness to furnish the required labor to carry out successfully the improvements undertaken. As one man said, "If someone would furnish a slight of hand method for speedy recovery of land that would require neither labor nor expense, I would be willing to undertake the task." Until that was the case, he felt that men would still cultivate the lands in corn one year, "rest" them in wheat the next, and so on until they were prepared for "a crop of old field pines— the best crop . . . since the introduction of steamboats, of the whole."[137]

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[135] *Farmer's Register*, I, 551.
[136] F. in *American Farmer*, XII, 411.

Another cause for failure was found in the great size of the estates of many who took up the new methods together with the fact that they still owned more slaves than could be efficiently employed. Success required close personal supervision of both lands and labor. Cultivation had to be restricted to smaller areas in order that the scanty supply of manure, so fundamental in any change, might make the rounds of the fields. The very excess of slaves required the continuation of the large estate and old slip-shod methods. Until an easy and profitable way of disposing of slaves opened, the excess of labor prevented any widespread experiment in its use for improved agriculture. Some did divide their lands, contract their tillage and lessen the number of slaves, but the majority did not, and a share of blame for failure in new methods must be placed to this account.[138] Exhaustion had played a part in the creation of the large estate, and now the large estate had a part in preventing recovery from exhaustion.

In many cases, even where cultivation was restricted, the owners were soon drawn off into politics and their efforts at reform thereby suffered. The call to public service was particularly great upon the class who had taken up the work of reform. Leaving their estates, they employed the negligent overseer in whose hands improvements either stopped or failed. In other cases it was simply the placing of greater emphasis on politics to the neglect of agriculture. Many evidently felt with Jefferson and John Taylor, that when the house was on fire there was no time for "saving the kittens."[139]

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[137] *Farmer's Register*, I, 186.

[138] Col. Thomas Emory to the Agricultural Society of Queen Ann County, Maryland, *American Farmer*, IV, 153-57; J. K. Paulding, *Letters from the South. . . . 1816*, pp. 96-97; E. W. in *Farmer's Register*, II, 177; *American Farmer*, III, 114; XII, 321; XV, 115; John Taylor, *Arator*, p. 260; Isaac Weld, *Travels through North America*, p. 115; Ed. Ruffin, *Farmer's Register*, IV, 98.

[139] *Thomas Jefferson Papers* (MSS), Vol. 106, No. 18115, Nov. 26, 1798, "It would be happy indeed for us if agriculture . . . still continued to be interesting . . . but alas! can we, when the house is on fire, be solicitous to save the kittens?" (To John Taylor).

The lack of capital was another handicap and cause for failure. The investments were often heavy and results slow in coming. Without a further reduction in the standard of living many men could not furnish the required capital for agricultural changes. The widespread complaint against hospitality, saddle horses, carriages, and other things which had long been a part of the life of the gentleman of this section, is evidence of the pressure for funds. Many men of the period considered that failure in improvement was largely due to the fact that men would not give up these "luxuries" in order to gain the capital required to continue.[140]

But the greater reason for failure lay in the lack of steady and paying markets. One has only to recall the uncertain and limited markets for tobacco and wheat offered in the period to understand the farmer who said, "It is not worth while to make crops— we can get nothing for them . . . neither is it any object to improve our lands[141] . . ." Jefferson himself was caught by the embargoes and blockades of the War of 1812 and with the loss of his crops checked his efforts at reform. The interior counties suffered even more than the tidewater section and the distance from market was the reason given by many for the failure to continue with the efforts begun towards a better agriculture.[142]

The relation of markets to improvement is well shown in the letter of a Bedford farmer: "The present state of agriculture generally in this county is a very bad one and in some particular parts of the county the worst I ever saw. There have been some particular periods when from particular causes, such as the extremely low price of tobacco . . . and the rise in the price of wheat, corn, etc., the country would for a short time present the appearance of an obvious change for the better. Then there seemed to be less tobacco reared and more grain of every kind in the fields, and more clover and grass of different kinds sown, and more plaster and manure generally sowed and used . . . and more attention paid to judicious ploughing . . . and to the raising of stock. But soon a little depression in price of wheat . . . and the scene by the next year is greatly changed; . . . you see all the best land . . . cultivated in tobacco and every thing like making and carefully saving manure, and applying the same . . . neglected." And the total neglect of everything like improvement in soil, or in the mode or manner of plowing and the prudent application and distribution of manure, was the general rule again.[143] The whole story of the uncertain and shifting markets during the period of the European Wars is here reflected in the fields of the struggling farmer. One is inclined to sympathize with the man who, after cultivating his lands year after year at a loss, sighed indeed for "another Napoleon to restore to us by his wars, the feeding of all Europe."[144]

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[140] *Farmer's Register*, II, 95-96; *American Farmer*, III, 114; XII, 321-22; *Thomas Jefferson Papers* (MSS), Vol. 99, No. 17038, Feb. 28, 1796.

[141] *American Farmer*, III, 114.

[142] *Thomas Jefferson Papers*, Vol. 86, No. 14861, May 15, May 26, 1793; Jefferson to Col. Gamble, May 19, 1793, "I wish to heaven the spirit of mill building and manufacturing which you mention to have taken place in Augusta, etc., could spread itself into Albemarle. We are miserably circumstanced there as to the disposal of our wheat. We can neither manufacture nor sell it there and tho we have fine mill seats at the head of navigation of the Rivanna, we cannot get mills built. We are however under these discourgements, going entirely into the culture of wheat, and shall be able to furnish a great deal . . ."

Another factor in the failure is found in the relation of government to agriculture. The farmers of the section had felt the effects of the financial and political uncertainty of the period of the Confederation and the later restrictions of the Embargo. But by the men of the period these were considered light as compared with the burdens which agriculture suffered because of tariffs lately passed in the interests of manufacturing.

John Taylor led in the protest against the unequal advantages now going to the manufacturing interests.[145] The flow of capital into manufacturing was, as he saw it, in part due to confidence engendered by the government's favors. Money necessary for agricultural improvement was thereby turned away or lifted to such high rates that agriculture could not afford to compete for it. Since manufacturing was to prosper by government encouragement, the manufacturer secured control of the government, while the farmer, ignorant of the ways of politics allowed others to rule and to tax him for the development of industries that competed with him for capital and labor. The manufacturer, therefore, flourished by government assistance while the farming interests languished.

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[143] W. C. in *Farmer's Register*, I, 337-38. See Jefferson's letter to Randolph, Feb. 8, 1826, *Writings of Thomas Jefferson* (Ford ed.), X, 374-75. Explains his failure by the "long continued depression of the farming business."

[144] A. B. in *American Farmer*, IX, 81.

[145] John Taylor, *Arator*, pp. 39-40.; 246 *et seq.*

He answered the arguments for tariffs as a means to counteract the low cost of foreign labor and for the development of home markets, by calling attention to the fact that the best markets for manufactured goods were at home while the best markets for agriculture were abroad; this meant that cheaper made foreign goods must first pay a freight charge before meeting home products, while agricultural products must cross the ocean and there meet foreign competition. This was enough of an advantage for home manufacturing and it would be more logical to contrast the high price of manufactures here with the low price there, to prove they ought to give a bounty to agriculture to provide home markets for manufactures.

As to the soundness of Taylor's arguments we need not judge. The point is that the farmers of the section thought they were being oppressed by the operations of the tariffs and saw in the course of events ample reason for accepting Taylor's explanation. Of this much they were certain. The government had given very little attention to the demands of the farmers for the establishment of an Agricultural Board such as England now had, nor had the government succeeded in making foreign agreements which opened markets to the produce of the section.[146] Maryland and Virginia now paid higher prices for manufactured goods with no return in increased markets or higher prices for their products. When limited home markets did arise in the section they were almost at once made as accessible to the west as to the home producer. Whatever effects elsewhere, depression was the continued order in this region.

The agriculturalist and his agricultural society, therefore, became the center of protest against the tariffs from 1816 on to the close of the period. Petitions poured forth from practically every society of importance in Virginia and from many in Maryland.[147] In a few places approval was given to the tariff, but it should be remembered that the agricultural society was not a purely rural affair and that in many places city men with a paternal inclination dominated the organizations.

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[146] *Washington's Letters on Agriculture* (Sinclair facsimile), pp. 42, 135.

The tariff must therefore be considered a factor in checking improvement if for no other reason than its psychological effect upon the struggling farmer. But there is much room for contending that it acted in a good deal more material way in helping to bring the movement for a better agriculture to an end. The farmer's ills were not all imaginary.

A final feature of the situation which was both a cause and a result of the failure to establish a permanent and paying system of improved agriculture was the steady westward emigration which went on throughout the whole period. The emigrant carried some of the capital so necessary to improvement with him into the west. But what was more important, whatever he carried with him lessened the value of everything left behind. The home market for land was always flooded and the price was thereby kept low. Men were tempted to put their money into the purchase of lands now partly exhausted, instead of using it for the work of improvement upon the lands they already possessed. And further, the low price of land acted as a check upon the man who would have reduced the size of his tract either by lease or sale, in order to better undertake the work of improvement.

But there was another side to it. The emigrant himself was worth something. Professor Dew of William and Mary College called attention to the fact that the emigrants were mostly young persons just reaching the age when self supporting and that the cost of rearing them up to this point now fell as a total loss upon the parent state.[148] Nor was this loss balanced in this section, as it was elsewhere, by the immigration of adults from abroad or from the older states. It constituted an actual loss of capital that brought no returns.

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[147] James M. Garnett to Fredericksburg Agricultural Society, 1821, *American Farmer*, IV, 41; *ibid.*, II, 89; III, 131; I, 321-25; Protest of United Agricultural Societies, of Virginia, 1820, *American Farmer*, II, 57-58; *ibid.*, II, 83.

[148] *Farmer's Register*, III, 754, 108-9; Prof. F. J. Turner, in *Proceedings of American Antiquarian Society*, XXIX (new series), 1919, 232-33. Professor Turner uses this method of valuing emigrants to measure the loss of capital by New England emigration.

And it was often the man of initiative and energy—the one most willing and able to undertake new things—who went west. "All our most independent and married men seem to be running to the west," declared a Virginian in 1796, and a foreign traveler in 1816 noted that "the most hardy, active, industrious children of the elder States . . . who have . . . courage to encounter the difficulties . . . go where the land is cheap. . . ."[149] But this operated in another way also. The man who contemplated emigration was not inclined to spend effort or capital in improving lands he was soon to abandon. Many faced the inevitable results of disastrous methods with a cheerful face knowing that an escape from the results of such a course was ever at hand in flight to the west. Along this particular line, James M. Garnett declared that "the circumstance alone of a new country almost boundless, in various parts of which fresh lands of great fertility have been for sale during many years at very low nominal prices, has greatly contributed to accelerate among our land killers the exhaustion of our soil and . . . prevented attempts at improvement."[150]

The flow of emigration begun already in colonial times had been augmented by the Revolution itself and Georgia and Kentucky had drawn heavily upon this section for population.[151] When Kentucky was admitted as a state in 1792 it was estimated that fully two-thirds of her 100,000 population were from Virginia and Maryland.[152] In the period from 1790 to 1800, thirteen out of twenty counties in Maryland and twenty-three out of forty in Virginia lost in free white population. Something like 43,000 free whites had departed from these counties in the period of ten years. The majority of the counties thus affected were in the older portions of the states and it is probable that if the movement within the states themselves could be figured the shifting of population would appear even greater.[153]

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[149] "Life and Times of Nathaniel Massie," by Massie, *William and Mary College Quarterly*, XIV, 94; James K. Paulding, *Letters from the South written during an Excursion of Summer, 1816*, p. 82-88.

[150] James M. Garnett, in *Richmond Enquirer*, June 19, 1818.

[151] *William and Mary College Quarterly*, XXVI, 149.

[152] *Niles Weekly Register*, I, 289-91. These figures are, of course, not exact but they give a general idea of the movement.

[153] *United States Census, Population.*

The movement went on at a slightly lower rate in the next decade but rose greatly in the period following the War of 1812. The opening of the southwest, the failure of markets, as well as the check given to improvements in methods, now augmented the movement and poured thousands out from the old regions.[154] The newspapers of the period were filled with advertisements of lands for sale and notices of westward departures. At one time in 1818 the *Richmond Enquirer* and the *Virginia Herald* carried advertisements for over 21,000 acres for sale, and an estimate of the period placed the total amount in all papers of Virginia at from 600,000 to 700,000 acres.[155] The demand for slaves from this section had also begun and funds and buyers from the lower south had already made their appearance. By 1820, Virginia and Maryland had fallen far behind the average increase of the country as a whole and were something like a million short in population of what the national average of increase would have given.[156] How much the failure to increase population at the same rate that the rest of the country as a whole was increasing was due to emigration it is impossible to say. It is probable that the natural increase would have been lower under the conditions as they were, yet the Virginians and Marylanders were found in great numbers in all the west, especially south of the Ohio.

It is thus apparent that the period from 1776 to 1820 had not solved the agricultural problems of the section. Permanent and paying markets had not been developed nor had the old agriculture based upon the expenditure of fertility completely passed away. In many ways, as has been said, agriculture was in the same condition it had been when the Revolution had come to an end. Yet some progress had been made. Of greatest importance perhaps, was the fact that the old colonial regime in agriculture had now been completely broken down. From the Revolution until now the colonial crops, markets, and methods had largely held sway. This was now ended. The hold of tobacco was now broken and complete dependence on European markets and marketing systems had largely ceased. The way was cleared for either a complete abandonment of much of the older section or the carrying forward of changes fundamental in agricultural affairs. Men had at last lost faith in the old things and no longer hoped for any success from them. They were now prepared to a degree to profit by the efforts of those who had already been trying to introduce new ways or to turn elsewhere to continue old things.

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[154] *Ibid.*; U. B. Phillips, *American Negro Slavery*, pp. 177-78; *Plantation and Frontier*, II, 201-8.

[155] J. M. Garnett, in *Richmond Enquirer*, June 19, 1818.

[156] The rate of increase for the country as a whole from 1790-1800 was 145.6%. Some writers have figured emigration by assuming that without it the population would be approximately increased the same all over the country and that the actual population subtracted from an increase equal to this figure would give the emigration. See P. Bidwell, "Rural Economy in New England," in *Transactions, Connecticut Academy of Arts and Science*, XX, 241-399, especially page 386; also F. J. Turner, *American Antiquarian Society Proceedings*, XXIX (new series), 224.

For those who remained, the successes or even failures of the earlier reformers now had great value. Here was the foundation upon which the future must be established. And great as had been the failures of the earlier agents of improvement, not all had been lost. The large estate had showed its inability to meet the needs of the future and was being, and was still more, to be divided; better plows and other agricultural implements had been introduced and had found a rather wide acceptance; in many parts gypsum, marl, and other fertilizers had resisted the general reaction and a better understanding of their uses been reached; barnyard manure at least was now everywhere recognized as an essential to agriculture and grasses of different kinds were being widely grown. With this much at least the man who now faced the future without faith in old colonial crops, markets, and methods, was equipped to make a start toward a more enduring agricultural revival.

CHAPTER IV

THE AGRICULTURAL REVIVAL, 1820–1860

The period from 1820 to 1860 falls naturally into two equal parts. The first twenty years were occupied largely with experiments and readjustments. In outer manifestations, decline predominated and an emigration which threatened at times to depopulate whole regions was the most noticeable feature. Yet underneath, certain fundamental changes were being made which were to give the section during the last twenty years before the Civil War, a fairly prosperous system of general diversified agriculture not unlike that existing in the northern states. The problems of markets and soil improvement were being attacked in a way that was to change the whole agricultural outlook of Virginia and Maryland. After 1840 the transition was fairly well complete and a new system established. For the first time since early colonial days the farmer was able profitably to improve his soils if he wished, and to enter into a system of agriculture that offered permanency as well as profit. When the war for Southern independence broke upon the nation, Virginia and Maryland were in the best agricultural condition that they had ever been.

The heavy emigration of the twenties and thirties was but the continuation of the earlier movement now augmented by the realization that the old agriculture no longer offered any hope. The removal of those who had lost faith and who would not take up the task of reform was in one sense an essential part of the preparation for the new order and until emigration had spent its force little could be accomplished. Men must either flee the impoverished lands or make an effort to improve them. An exhausted soil was at the bottom of the situation. "Ask those who have gone, or are going West, why they have left, or intend to leave their native hills," declared the editor of the *Farmer and Gardener*, "and they will tell you 'the soil is worn out.' "[1] "If any system can be devised by which the worn lands can be restored, emigration will cease," was the statement of a farmer who himself contemplated a move into the West.[2] Under such conditions the call of fresh lands was indeed powerful and the inducements to take up reform, weak.

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[1] Editorial in *Farmer and Gardener*, II, 106-7. It is interesting to note that there was no emigration from East Shore of Virginia and no exhausted soil. *Farmer's Register*, III, 233-36.

From 1820 to 1830 Virginia's rate of population increase fell from 37½ per cent where it had stood in the previous decade, to 13½ per cent. The increase of free whites fell from 35 per cent to 15 per cent for the state as a whole with a loss of 92,625 persons in the eastern section.[3] The total increase of whites in the next period (1830-1840) was only a trifle over 3 per cent and there were some 26,000 fewer people in the older portions of the state in 1840 than there had been ten years earlier. Many counties in the Tidewater and Piedmont regions lost population and only the growth of the western counties gave the state any gain whatsoever.[4]

Maryland's losses were in part hidden by the rapid growth of the city of Baltimore. Yet the free whites increased by only 24,000 in the period from 1820 to 1830 and by only 27,000 in the next decade. The Eastern Shore was at a standstill from 1800 to 1840 and many of its counties had lost population. Counties like Talbot or Queen Anne had less population by over 2,000 in 1840 than they had in 1820.[5] Nor was the Western Shore any better off. The *Wheeling Gazette* in two days in 1834 counted sixty-four persons from one neighborhood on the Western Shore passing through that town on their way to the West, and one estimate placed the value of property and money carried from Charles and St. Mary's Counties in eighteen months (1836-37) at nearly one and a half million dollars.[6]

In 1850 there were 388,059 Virginians and 127,799 Marylanders living in other states.[7] Nearly one-third of the Virginia-

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[2] *Farmer's Register*, II, 382-83, 577-80.

[3] *United States Census; Farmer's Register*, I, 5.

[4] See Harrison's "Review of the Slave Question," *Farmer's Register*, I, 40. List of counties in middle and upper Va. which had lost population, Brunswick, Amelia, Goochland, Loudoun, Mecklenburg, Fairfax, James City, King and Queen, King William, Lancaster, Northumberland, Sussex, etc.

[5] *The Plough, the Loom, and the Anvil*, I, 175-76; *United States Census*, 1840.

[6] *Farmer and Gardener*, II, 106-7, 321.

[7] *Census* (U. S.), 1850. See F. J. Turner in *Proceedings of American Antiquarian Society*, XXIX, new series (1919), 232-33.

and Maryland-born had found homes in the greater West and Southwest. The losses to the parent states were enormous. In the Virginia Convention of 1829 one man estimated that the land values of the state had declined from $206,000,000 in 1817 to $90,000,000 in 1829 and three years later Thomas Marshall declared the products of the state were worth no more than they had been 80 or 90 years earlier when the population was but one-sixth of what it was in his day.[8] Valuing the adults at one thousand dollars, as does the government emigration test, and estimating the adults at one-fifth of the total emigration—a figure too low because of the large number of young men who went west—the census figures of 1850 would give a total loss in wealth upon these states of $103,171,000. If each family carried $200,—the emigrant property test,—a sum of $20,634,200 must be added, giving a grand total of $123,805,200 which fell as a dead loss upon these already exhausted states.

It is little wonder then that the parent states were alarmed. The sight of the young men— "our most hardy and energetic"— going ever to the west, leaving the homes and churches filled with old maiden daughters, was truly alarming.[9] The "vital part of society" seemed to be going, leaving the "head and tail" behind. It was those too poor to move or those too comfortable to wish to change that continued their life at home.[10] Under such conditions improvement was indeed hard. "If there had been no western country. . . . Virginia would already have reached a high state of agricultural improvement and prosperity," was the statement of one writer;[11] "it is one of the principal causes of our stationary condition and the great depression in the price of real property" was the opinion of another.[12]

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[8] *Debates, Virginia Constitutional Convention, 1829-30*, p. 178; *Richmond Enquirer*, Feb. 2, 1832.

[9] *The Plough, the Loom, and the Anvil*, I, 175-76; *Farmer's Register*, II, 762-63-64. . . . "The fences being thrown down, it soon becomes common pasture, gullied, or grown up in pine barrens; its owner is restricted to a narrower limit in his system of exhaustion and destruction, until, becoming too much indebted, he sells out and removes to a more fertile and cheaper soil in the west. Thousands are traveling the same road urged by the same causes. The educated, active, and enterprising young men, despairing of success with this example before them, are leaving the state very rapidly. . . .; and besides all this, the traders are carrying off our slaves in great numbers. . . . The tide of emigration is regularly increasing from all classes. . . ."

[10] *Farmer's Register*, III, 685-88.

[11] *Ibid.*, V, 127-28.

Memorials now poured into the legislatures calling attention to the great danger and the need of aid to agriculture as a prevention to further losses. In Maryland the reduction of the soils to a state of poverty was assigned as the cause for emigration and the demand made for a pattern farm, an agricultural school, a state agricultural society, bounties for special crops, and a state agent to gather information and teach better ways of farming.[13] In Virginia a fear of the depopulation of extensive neighborhoods was expressed and the aid of the legislature implored to prevent widespread abandonment and political degradation. A professorship of agriculture was asked for the State University, the founding of a state agricultural society or agricultural board was urged as an absolute necessity if ruin was not to overtake the state, and an agricultural survey demanded from the legislature—the state's "one forlorn hope in this fearful crisis."[14]

By 1840 the flood tide of emigration had been reached and from that time on the outward flow was lessened. The passing of the first flush days in the cotton lands, combined with the establishment of a more permanent and profitable agriculture at home, removed the greater causes which had urged men out toward the setting sun. Some emigration still went on but it did not greatly interfere with the agricultural life at home.

The flow of emigration to the west made the task of improvement at home vastly heavier but none the less necessary. The loss in capital and man power only enforced the realization that the old order had passed and a new order was at hand. Men saw clearly and declared openly that the section was in transition from the "large possessions, well disciplined and profitable slave labor, elegance of manners and luxury of living, to a condition in which estates will all be cut up, slavery . . . disappear . . . and every mother's son, as in the country of New England . . . put his own hand to the axe and plough."[15] Daughters were warned that they must give up their silks and satins and betake themselves to the churn and wheel; every man was to make his own cheese and drink his own cider; the government was to begin that legislation which looked not to the production of a few high and enlightened men but by public education level the whole people to a lower but more uniform state of intelligence.

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[12] *Ibid.*, III, 138-39.

[13] *Farmer and Gardener*, II, 321.

[14] *Farmer's Register*, III, 619-26, Prof. Dew of William and Mary College. He also calls attention to the fact that it is the young men who go west and for whose education the state has spent much. See *Niles Register*, XLIII, 23; XLIX, 154; LI, 83; XXXIII, 211, 347; XXXV, 97.

[15] Editorial, *American Farmer*, VIII, 375.

Nor did men longer shut their eyes to the fact that conditions were hopelessly bad. The *American Farmer* in Maryland and the *Richmond Enquirer* in Virginia both proclaimed the futility of longer denying the fact that the section was far behind others, and that "benumbing poverty" and "broken spirits" were the characteristics of these once great states. They called attention to the fact that the proud, well-bred gentlemen farmers, living in good dwellings, with families "genteely clad and well educated," were now but memories. In their places had come poorer homes, truck patches of cabbages and potatoes where once the great gardens of jassamines, tulips, and roses grew, and families that knew not education or hospitality. With "inexpressible pain" they called upon their fellows to "awake, arise, or be forever fallen."[16]

Societies were formed to encourage the wearing of home manufactured clothing, to diminish the quantity of groceries consumed, and to pledge their members to dispense with all needless expenditure.[17] For the first time in years individuals and the press dared to openly discuss the ills of slavery as affecting the development of agriculture, and to urge the benefits to be derived from emancipation.[18] In Maryland it reached the point where the passing of slavery was taken as a matter of course and immigration was invited from the free states with the assurance that slavery was no longer possible and would soon be a thing of the past.[19] The Virginia legislature entertained resolutions which looked forward to the ultimate extinction of the institution and men were emboldened to openly proclaim slavery as one of the causes for the agricultural decay that was so apparent.[20] Even those who did not go so far in their condemnation saw the necessity for decreasing the number of slaves employed and urged the selling off of such numbers as would make possible greater efforts at improved methods in agriculture. A destruction or diminution of slavery was to be one of the first steps toward a more intensive and intelligent cultivation of the soil. A few, however, saw a new need for slavery in the new agriculture and remained ardent in their attachment to the institution. Yet even these thought the number of slaves employed could well be reduced and better results secured from the remainder.[21] With such a state of mind, the demand for slaves from the cotton lands of the southwest was willingly met, and a steady stream of black hands began to drain off from the section. The slave dealers at Alexandria, Petersburg, Lynchburg, Richmond, Norfolk, etc., did a flourishing business until the newer states began to pass unfriendly legislation against such shipments.[22] Slave labor was not essential to grain production and though it did prove profitable on the larger river plantations its place in the economy of these states was greatly weakened.

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[16] *American Farmer*, VIII, 359-60, 375-77; *Richmond Enquirer*, Mar. 1, 1828.

[17] *Richmond Enquirer*, June 27, 1828.

[18] *Richmond Enquirer*, Jan. 11, 1832, says first time in twenty-seven years the newspaper has touched the subject. Press unshackled.

[19] *American Farmer*, VIII, 206, "slave labor is unprofitable and is going out of use."

Fundamental in any effort at improvement of the soil, and through it the agriculture of the region, was the problem of markets and roads to market. Before improvements could be permanent, agriculture had to be put upon a paying basis. Produce had to find its way out and to profitable sale before other changes could be made. Until something had been done toward the solution of this problem it was useless to hope for that better agriculture which would restore the soil and check emigration and decline. Internal improvements and new markets were foundations which must be laid for the new agriculture to rise upon.

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[20] See speeches of Mr. Moore or Mr. Balling as reported in *Richmond Enquirer*, Jan. 19, 1832, with editorial comment. (Tidewater becoming haunts of wild animals, as poor whites are driven out, and slaves increase so rapidly as to consume all the capital that might be used for agricultural improvement.)

[21] *Farmer's Register*, IV, 695-700, "I consider slavery an evil of great magnitude, yet I am not in favor of abolition,—very far from it." "The best way to handle the situation is to cut down numbers;" *ibid.*, VII, 235-38; *American Farmer*, I, 65, "If the number of slaves are burdens on the southern landholders" writer suggests emancipation or colonization for part of them.

[22] *Richmond Enquirer*, Sept. 22, 1833; U. B. Phillips, *American Negro Slavery*, pp. 190-204.

The new period made its first forward steps upon the old tobacco markets supplied from a greatly restricted area, and upon a new market for grain and flour in South America and the West Indies. Tobacco, though grown to a degree throughout the section, was now largely centered in lower Maryland and in central Virginia south of the James. Its markets remained as of old, with increasing sale for manufactured products on the plantations of the lower south. The South American grain and flour trade first developed during the Napoleonic wars but grew to important proportions in the thirties and thereafter. The removal of restrictions in the West Indies in the early thirties gave opportunities there and the rise of towns and manufactures at home offered some outlet for the produce of local market gardens and dairies. Wider markets were found in some cases in the north and some trade still went on with Europe, rising in volume when conditions gave satisfactory openings. In the period from 1846 to 1855, Baltimore was sending an annual average of over 144,000 barrels of flour to England, due to the repeal of the Corn Laws and in the closing years, to the Crimean struggle. Yet the greater openings were in South America and in the West Indies. Grain and flour could be sold there increasingly and at a good profit. If grain from the interior could find its way to the coast for manufacture into flour, a greater prosperity was offered to the farmer.

The nation-wide interest in internal improvements had not passed by this section and the interest of Baltimore, Richmond, and other towns in a western connection such as New York had secured in her Erie canal, gave a new impulse to the old joint undertaking of the two states in the Chesapeake and Ohio canal.[23] This project, like others that had been taken up in the earlier period, had lagged far behind and by 1820 had little but debts to show for the trials that had been made. Even now sectional jealousies prevented greatest success yet in spite of these differences and a waning interest, some thirty miles of canal were completed by 1830 and the whole project finished to Cumberland in

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[23] G. W. Ward, *The Early Development of the Chesapeake and Ohio Canal Project* (*Johns Hopkins University Studies in Historical and Political Science*, Series XVII, Nos. 9-10-11, Nov., 1899); *DeBow's Review*, X, 652-54; *American Farmer*, VII, 317, 319, etc.; I, 331; *Richmond Enquirer*, Mch. 1, 1828, "Norfolk will be the emporium—the New York of the Middle States, with several Albanys back of her."

1850. By 1840 it was furnishing an outlet to the produce along its course and its tolls for the year previous amounted to $42,835.[24] The slow building of the canal and the rise of the railroad caused the canal to be more or less of a disappointment yet it did something for the regions along the Potomac and had a part in enabling them to improve their methods of farming.

Maryland's further improvements were largely shaped by the interests and needs of the city of Baltimore. That city had at first given its support to the Chesapeake and Ohio canal project but soon discovered that the branch canal by which she was to be joined to the main line was at best a very poor investment, indeed if it was physically possible at all, and turned her attention to the construction of a railroad into the west. The Baltimore and Ohio Railroad was begun in 1828 and by 1831 had reached Fredericksburg and a year later Point of Rocks.[25] It reached Harpers Ferry in 1834 after a legal battle with the Chesapeake canal and pushed on westward to Cumberland in 1842 and to Wheeling ten years later. Meanwhile a branch was opened southward down the Valley of Virginia and in the east connections were made with the city of Washington.

From the very beginning the road was swamped with freight, a goodly proportion of which was in the form of agricultural produce.[26] In the first few months the freight offered was about ten times as great as the company could handle. Every species of farm crop was brought to Baltimore and in return, lime, plaster of paris, and other articles were shipped into the interior.[27] In 1832, almost 147,000 barrels of flour were shipped in from Ellicott's Mills and Frederick. In the same year some 353 tons of grain, 512 tons of meal, and 174 tons of tobacco were carried. These shipments rose steadily and in 1840 the quantity of flour had risen to 392,449 barrels, the grain to over 2,000 tons, the meal to an equal amount and the tobacco to 900 tons. By 1852 the flour shipments stood at over 617,000 barrels, the grain at nearly 5,000 tons, the meal at 3,000 tons, and the tobacco, showing the effect of western competition, at 950 tons. At the city of Baltimore over 700 ships were doing business in 1850 and a year later the number had increased to 1445.[28] The whole region of western Maryland, upper Virginia, and the Valley of Virginia, had found a better way to bring their produce to the growing markets at Baltimore. Even the regions of Virginia and Maryland in the Chesapeake Bay neighborhood to the south of Baltimore now turned to that city for better markets, and with the completion of the Washington branch of the Baltimore and Ohio Railroad the merchants of Alexandria began to feel the competition from the larger city.[29]

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[24] Alexandria profited greatly by the grain shipments via the canal and her merchants shipped heavily to the North, to England, and to the Barbadoes. On November 7, 1839, Wm. Fowle & Co. were writing to Fairbanks & Allison of Halifax that ". . . every barrel of flour is sought for with avidity for remittance to the North, or shipment to England. . . ." That this grain came via the canal is shown by the letter of November 9, 1839, to Robert Bailey & Son, Newport, in which the failure to send grain is said to be due to the fact that the canal is out of order and none is to be had. They promise grain as soon as repairs are made. Wm. Fowle & Co., *Letter Book* (MSS), Nov. 1, 1839 to March 22, 1841; The *Wheat Accounts* (MSS), of this firm show large shipments of wheat to Boston, Eastport, Halifax, St. Johns, New York, Liverpool, Philadelphia, and the Barbadoes, the larger part going to northern millers. *Wm. Fowle & Co. Wheat Accounts, 1852-1854* (MSS).

[25] Milton Reinzenstein, *Economic History of the Baltimore and Ohio Railroad* (*Johns Hopkins Studies in Historical and Political Science*, 15th Series, Nos. 7-8, 1897).

Caroline E. MacGill and Staff, under B. H. Meyer, *History of Transportation in the United States before 1860, passim.*

[26] Milton Reinzenstein, *op. cit.*, pp. 24-26.

Nor was the Baltimore and Ohio the only railroad offering its services. The Baltimore and Susquehanna was completed north from Baltimore in 1838 and in 1841 did a business of $33,000 and a year later of $68,000.[30] Another line connected with Philadelphia in 1839 and in the same year the Annapolis and Eldridge branch connected with the Baltimore and Ohio Washington branch.

It will thus be seen that the railroad offered the farmers of Maryland and the valley of Virginia better transportation than

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[27] *Ibid.*, p. 33.

[28] Milton Reinzenstein, *op. cit.*, p. 88; *Farmer's Register*, II, 469.

[29] As early as 1792 Alexandria had begun to feel the competition of Baltimore and had petitioned for right to establish a bank saying that the fertile back country and the Valley trade went to Baltimore because of better banks. See *William and Mary College Quarterly*, III (new series, Jan., 1923), No. 3, 206-7. C. E. MacGill, *op. cit.*, 397-413.

C. E. MacGill, *op. cit.*, 397-413.

[30] C. E. MacGill, *op. cit.*, 413.

had before been dreamed of. By 1840 the lines were well under way and enough done to make possible a more permanent system of farming. Improved transportation was one of the necessary steps toward better farming and something at least was now completed along this line in the state of Maryland. Even the efforts of Pennsylvania to improve her transportation facilities benefited parts of Maryland and especially after 1840, use was made of markets other than Baltimore.[31]

With the heavy shipments of wheat and flour from the back country of Maryland and Virginia, Baltimore grew into a great milling center and developed a trade in flour and grain with South America and the West Indies that made her the second largest shipper of flour in the nation.[32] As early as 1832 she had established a reputation for fine flour and there were sixty flour mills within a radius of twenty miles of her borders.[33] The South American trade was well established by 1840 and an average of 129,000 barrels of flour were shipped in the period from 1840 to 1850 and an average of 153,617 in the next decade. The West Indies trade was only a trifle less in proportions and averaged 104,720 barrels from 1840 to 1850 and 145,252 barrels from 1850 to 1860. Many articles entered into this trade but flour usually predominated. In 1827 it formed 68 per cent, and in 1858, 59 per cent of the South American trade. It always constituted from 70 to 75 per cent of the trade with Brazil and was the greatest article in the West Indies trade of the period.[34] The grain fields of Maryland and of a portion of Virginia reflected this prosperity and upon these markets developed their agriculture.

In Virginia the early interest in internal improvements confined itself to canals—the joint efforts with Maryland in the Chesapeake and Ohio and the renewed efforts on the old James River improvements being the first results. The first of these has already been treated and we will notice only the second here. Early efforts on the James River project had come to little and in 1820 the state agreed to take over the charter of the company with the idea of completing the work and joining it with the Kanawha turnpike into the west.[35] Action, however, was slow and in spite of considerable agitation culminating in an internal improvement convention at Charlotte,[36] sectional jealousy prevented rapid progress and in 1835 the state was glad to turn the project over to a new company formed to take up the task. Better progress was now made but the long delays had given the railroad time to demonstrate its superiority and the canal was never a great success. Nevertheless it did offer improved shipping facilities to a section that was now growing large quantities of wheat and considerable tobacco. Freight rates were lowered and shipments increased as the canal was operated farther west. In 1841 over 110,140 tons of freight passed along the canal; in 1845 it reached 134,759 tons; in 1852, 210,140 tons; and in 1860, 244,273 tons. In 1860 the freight included 695,388 bushels of wheat; 78,711 barrels of flour; 15,000 pounds of tobacco in bulk and 53,070 boxes in manufactured form.[37]

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[31] Milton Reinzenstein, *op. cit.*, p. 82.

[32] F. E. Rutter, *South American Trade of Baltimore* (*Johns Hopkins Studies*, Series XV, No. 9, 1897), quoted from *Price Current*, Annual Statement, 1857.

[33] Jared Sparks, *North American Review*, XX, 123.

[34] F. E. Rutter, *op. cit.*, pp. 17-18. See table, p. 18 ff.

Richmond became, like Baltimore, a great milling center and developed a heavy trade with South America and the West Indies. As early as 1817 she had mills grinding 1000 barrels of flour a week.[38] In 1832 one mill in the city ground 235,250 bushels of wheat producing 48,100 barrels of flour. Of this, over 38,000 barrels went to South America and a goodly portion of the rest to the West Indies. This mill had fourteen pairs of burrs while a new mill just then completed had twenty pairs.[39] Richmond's shipments to South America at times surpassed those of Baltimore, but the general course was a trifle lower. In 1845 she sent over 80,500 barrels of flour to Brazil and in 1849, over 90,000 barrels. Her annual shipments averaged about 40,000 to Brazil and a little less to the West Indies and other ports. In 1855 there were 1217 boats entering her docks and 1377 leaving; in 1860 some 2123 ships entered and 2337 left. In the latter year they carried out from the city 423,194 barrels of flour, 143,000 bushels of wheat, and 56,367 packages of tobacco.[40]

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[35] W. F. Dunaway, *History of the James River and Kanawha Company* (*Columbia University Studies in History, Economics, and Public Law*, Vol. 104, No. 2); C. E. MacGill, *op. cit.*, pp. 269-73.

[36] *Richmond Enquirer*, March 1, 1828; April 4, 1829; June 20-23, July 4, 11, 25, 1828; Jan. 7, 1832; *Farmer's Register*, I, 3-4.

[37] W. F. Dunaway, *op. cit.*, pp. 165-70.

[38] *Farmer's Register*, II, 141.

[39] *Ibid.*

But this trade in and out of Richmond was not all carried by the James and Kanawha Canal though it was the heaviest carrier in the state even in 1860. Railroad building had made considerable progress not only with Richmond as a center but in other parts of the state as well. This movement had begun in Virginia in 1831 when the Stanton and Potomac (the Valley branch of the Baltimore and Ohio) and the Petersburg and Roanoke lines were chartered. Building went on heavily during the thirties and forties and in 1852 there were 676½ miles of track completed and 676 more projected or under construction.[41] By 1860 the Virginia Central followed the fall line from the Roanoke to the Potomac; a line ran from Norfolk westward across the state to Lynchburg and on into Tennessee; both Norfolk and Petersburg were connected with the Roanoke; a road joined Richmond and Danville; the Orange and Alexandria ran diagonally from the Potomac to the southwest; and numerous shorter lines in the north and central sections connected between different points on the various roads.[42]

The system was far from complete and parts of the state were still without railroad connections. Often, moreover, the service offered was poor and the charges high, yet much had been done for both the tobacco regions and the central and Valley wheat sections by way of improved ways to market. The real trouble had come from the divided interests of the state and the prejudices against government activity in such undertakings.[43] This caused improvements to be made too slowly to give greatest advantage and often prevented the most beneficial works from being undertaken. Tidewater Virginia having made some progress in general farming and special crops for northern markets was satisfied with her navigable water outlets and feared the competition which a western connection might give. The Valley was rather well satisfied with the outlet at Baltimore and saw no reason for added expenditure. The central regions, too often divided among themselves by interest in different river improvements, could secure only such action at any one time from the state as the politicians thought necessary to give political advantage. Such division caused the greatest effort in the state to be given to a canal whose completion was so delayed that the railroad period had dawned before it was available and the western trade that it might have hoped for had already established better ways out. Yet in spite of delay and partial failure the canal was a benefit to some and opened the way for better methods in agriculture through the prosperity it afforded. The railroad also had in part done what the state had failed to do and had given certain sections improved carriers to market. "The wheat crop is becoming more profitable as the facilities to market have increased. . . . since the construction of the Petersburg railroad," writes a southwestern Virginia farmer who now planned to restore his exhausted lands. "A desire to improve begins pretty generally to prevail," he adds, thereby showing the relation of profits to improvements.[44] A writer from the Valley proclaimed that a new day had dawned for the Valley with the completion of the railroads and that the farmers were awakening from the errors of exhausting methods and beginning new and better ways.[45]

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[40] W. F. Dunaway, *op. cit.*, p. 165.

[41] C. E. MacGill, *op. cit.*, p. 462.

[42] *Ibid.*, see table of lines and mileage.

[43] See *Richmond Enquirer*, April 4, 1828 for Valley opposition; July 4, 1828, for coast statement; also Jan. 31, 1832; *Southern Planter*, VI, 64-65 (says other states have already tapped the region west of Virginia); *Southern Planter*, VI, 1-2; *ibid.*, V, 258-60, "What does it avail the farmer to tell him how to make two bushels of wheat where he made only one before, if it costs him all that wheat will bring to get it to market?"

A second essential to a new agriculture was the finding of ways by which the worn and exhausted soils of the states might be restored. Something had been learned about the improvement of soils in the previous period but too often failure had come from other causes and cast doubts upon sound methods. And too often the methods tried had not been sound and the good and bad suffered alike from the failures. A new trial of old methods and trials of new ones now began with better chances for success.

The great figure in this movement was Edmund Ruffin.[46] Beginning with the understanding that the real problem to be solved was that of restoring the exhausted fields to a new fertility, he found the chief obstacle to lie in the absence of calcareous materials in the soils of lower and much of upper Virginia and Maryland. His life was spent in preaching the new doctrine of improvement based upon the application of calcareous manures largely in the form of marl. At the end of three decades he saw thousands of acres restored to a new producing capacity and the lands of his state and her northern neighbor lifted to a new value. "His monument," says one writer, "is the soil of his state."[47]

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[44] *Farmer's Register*, I, 33-36, Nov., 1833.

[45] *Ibid.*, II, 28-30 (1835).

[46] There are a number of short sketches of the life of Edmund Ruffin but no complete biography. See H. G. Ellis in *John P. Branch Historical Papers of Randolph-Macon College*, III, No. 2, 99-123; *DeBow's Review*, XI, 431-36; W. P. Cutter, *Yearbook of the United States Department of Agriculture*, 1895, p. 493; *Bulletin of Virginia State Library*, XI, Nos. 3-4; *Diary of Edmund Ruffin* (MS).

Ruffin began his efforts at improvement shortly after the War of 1812 and gave the teachings of the great John Taylor a thorough trial on his estate at Coggins Point. He found almost every man in his neighborhood "growing poorer, or the prospect of his family becoming worse. The grade of society had been and still continued to be on the decline. The proprietors, having no hope of the improvement of their lands, or of being remunerated for ever so great industry or devotion to their business, thought it as well to bestow very little. . . . There was scarcely a proprietor . . . who did not desire to sell his land, and who was prevented only by the impossibility of finding a purchaser, unless at the then very low value. All wished to sell, none to buy."[48] Throughout the county of Prince George where he lived, and throughout the whole of lower Virginia emigration seemed to be the only refuge and abandoned mansions stood everywhere "in silence and ruin" while the former inmates "made their melancholy way to the wilds."[49]

After four or five years of faithful trial of Taylor's methods, Ruffin found them either "profitless, entirely useless, or absolutely and in some cases greatly injurious." The manures which he applied to his lands were not permanent and the soils fell to ruin under his efforts. In desperation he turned to the study of Davy's Chemistry and came to the conclusion that the trouble in lower Virginia as well as elsewhere in the section was the acidity of the soil. On examination he found that fertility seemed to go with the presence of calcareous materials and that whortleberries, sorrel, broom grass, and pines grew on acid soils but disappeared where calcareous materials were present. His observations, while not entirely correct, led to the conclusion that much of the so-called exhausted land was in reality fertile and would return to its original productivity if its acid condition could be corrected. Blessed with an abundance of marl—calcareous matter from marine deposits—he made the trial and proved to his satisfaction the correctness of his conclusions. The experiment with marl, as has already been shown, was not entirely new, but for the practical regeneration of the soils in this period this was the real beginning. Some efforts with marl were still being made in Maryland and in one section at least, its use was well understood.[50] Yet it was to Ruffin and his work that the two states owed the widespread introduction of this great improver and Ruffin reached his conclusions and did his early work without knowledge of what others had or were doing.

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[47] *American Farmer*, VII (4th series), 297.

[48] The story of Ruffin's early experiments are best told by himself in *Farmer's Register*, VII, 659-67. See also first chapters in his *Essay on Calcareous Manures*, also *American Farmer*, III, 313-19.

[49] *American Farmer*, VII (4th series), 293.

His first experiments gave him in some cases as high as 40 and 50 per cent increases in yields and his later efforts even more.[51] Convinced of the great benefit that might come to his state and section, Ruffin now began his efforts to spread the information he had gained, by reading a paper before the agricultural society of his own county. This paper, later enlarged and published in the *American Farmer*, was the beginning of the celebrated *Essay on Calcareous Manures* which was to run through five editions and grow from a few pages in an agricultural journal into a book of 116 pages in the 1835 edition and one of 493 pages in the 1852 edition.[52] At the end of the century, over sixty years after the book was first published, a writer in the *Yearbook of the United States Department of Agriculture*, called this the "most thorough piece of work on a special agricultural subject ever published in the English language," and pronounced his experiments so detailed and scientific in preparation and planning that the work was among the best ever done in the country.[53] Contemporary writers ranked him at once with the great John Taylor, toasted him as the greatest benefactor of the South and prophesied that his memory would be cherished with gratitude long after the political leaders of the day should be forgotten.[54] Ex-President John Tyler placed the picture of Edmund Ruffin over his fireplace as a companion piece to that of Daniel Webster and proclaimed them the greatest American agriculturist and the greatest American statesman. In the case of Ruffin, at least, there was nothing either personal or political to have influenced the selection.

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[50] Talbot County (Md.), *American Farmer*, XIII, 201, 249. John Shingleton had used marl here for many years and the knowledge had spread.

[51] *American Farmer*, III, 313-19; *Edmund Ruffin Diary* (MS).

[52] The third edition was published as No. 12 and supplement of Vol. X, of the *Farmer's Register*. First Edition, Jan., 1832; second, April, 1835; fourth, 1844; fifth, 1853.

[53] W. P. Cutter, *Yearbook, United States Department of Agriculture, 1895*, p. 493.

Ruffin based his teachings upon five propositions, stated briefly in his first paper and enlarged upon in later editions:[55]

1. Soils naturally poor, and rich soils reduced to poverty by cultivation, are essentially different in their powers of retaining putrescent (or alimentary) manures; and, under like circumstances, the fitness of any soil to be enriched by these manures is in proportion to the degree of its natural fertility.

2. The natural sterility of the soils of lower Virginia is caused by such soils being destitute of calcareous earth, and their being injured by the presence and effects of vegetable acid.

3. The fertilizing effects of calcareous earth are chiefly produced by its power of neutralizing acids, and of combining putrescent manures with soils, between which there would otherwise be but little if any chemical attraction.

4. Poor acid soils cannot be improved durably, or profitably by putrescent manures, without previously making such soils calcareous, and thereby correcting the natural defect in their constitution.

5. Calcareous manures will give to our worst soils a power of retaining putrescent manures, equal to that of the best—and will cause more productiveness, and yield more profit, than any other improvement practicable in lower Virginia.

In Ruffin's thinking marl had a two-fold purpose: first to get rid of acid in the soil, and second to preserve organic manures from loss of gaseous products of decomposition and hasten their decomposition. Its value lay in its power to correct a fault and to prepare for the greatest benefits from the application of manure.

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[54] N. Herbermont of South Carolina quoted in *John Branch Papers*, III, No. 2, 99-123; *Address of Willoughby Newton to Virginia Agricultural Society*, 1852.

[55] *Essay on Calcareous Manures* (5th edition), p. 39-40.

Ruffin's success and influence were not great at first.[56] Only two of his neighbors tried out his methods as advocated in the paper before the county society and both of these soon abandoned the effort as a failure. One of them referred to the hole from which he had digged his marl as "Ruffin's Folly." But with the development of the theory and the publication of the essay in the *American Farmer* and later in book form, a wider interest was awakened and better success attained. Marl became a subject of great inquiry and testimonials of its benefits poured in from those who had made the trial.[57]

Ruffin now decided to establish an agricultural paper in Virginia as a means of spreading the gospel of marl as well as good farming methods in general. The *Farmer's Register* began publication in 1833.[58] It was the second agricultural paper attempted in the state, and by far the most pretentious. Theoderick McRoberts had started *The Virginia Farmer* at Scottsville (Va.) a few years earlier, but the paper had never been strong and its influence, though good, was always limited. Its editor now realized that his "humble" paper must "drop like the harebell before the sun" at the coming of Ruffin's publication. The *Farmer* temporarily suspended publication in the following summer, then removed to Farmville where its existence soon came to an end, leaving the field to the *Farmer's Register*.[59]

Ruffin began his paper without sufficient subscriptions to pay for the enterprise but soon found in the awakened agricultural interest of the state sufficient support to prevent financial losses.[60] In an editorial in the first issue the purpose of the paper was declared to be the spread of agricultural knowledge and the furnishing of a means of communication between those who were making an effort toward improvement. Original communications on experiments, articles copied from other publications, reviews of books on agriculture, etc., discussions of questions of political economy relating to agriculture, chemistry, topography, soils, minerals, science, and public improvements of roads, were some of the subjects that were to find space in the new journal.[61] Purely political matters were not to be discussed and advertising was to find no space in its pages.

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[56] *Farmer's Register*, VII, 659-67.

[57] *American Farmer*, V, 387; II, 9-10, etc.

[58] *Bulletin of Virginia State Library*, XI, Nos. 3-4, 42-43. Complete files of this paper in Library of Department of Agriculture, Washington, D. C. Began publication June, 1833, and ended Dec., 1842. Ten Volumes. First nine volumes rather common, tenth rarer.

[59] *Richmond Enquirer*, June 28, 1833. Quotes editorial from the *Farmer*. Files of the *Farmer* are not now available.

[60] *Farmer's Register*, I, 62 (editorial).

From the very first issue the reception given the *Register* was hearty and enthusiastic. The *Richmond Enquirer* hailed it as forming a new era in the agriculture of the state and John Skinner, the former editor of the *American Farmer*, proclaimed it the "best publication on agriculture which this country or Europe has ever produced."[62] For ten years it was the leading factor in agricultural reform in the section and in the judgment of many, contributed more to produce the spirit of agricultural improvement than anything "said, . . . done . . . or written since the first settlement of the state."[63] Political hostility aroused over the attitude of the editor upon the bank question in Virginia combined with the general economic depression of the late thirties and early forties, brought the paper to an end in 1842 but its editor continued his work through other mediums and the *Southern Planter* took up the editorial task of reform where the *Register* left it.

The influence of Ruffin's *Essay on Calcareous Manures* and of *The Farmer's Register* can hardly be estimated in the history of the agricultural improvement of the section. The soundness of much that he advocated has never been questioned. In some cases he was wrong in theory but as with other men of the period, wrong practices did not always follow. Even in the use of marl he saw only the neutralizing benefits and its power to fix manures, and he was quite inclined to underestimate the value of green sands. Yet the use of these, as well as other rock fertilizers was largely the result of his efforts and the interest he had aroused in the subject. And the application of marl, green sands, etc., was the most fundamental improvement that had yet been attempted in dealing with the soils of the region. They afforded not only a neutralizer but often added valuable quantities of potassium and phosphates which, when combined with the use of gypsum in the growing of legumes, as was so often the case, gave a rather complete fertilizer.[64]

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[61] *Farmer's Register*, I, 62.

[62] *Richmond Enquirer*, June 18, 1833; Aug. 2, 1833; Nov. 11, 1834.

[63] *Farmer's Register*, V, 34-35.

Ruffin included as an essential accompaniment to the use of marl, the application of manure and insisted that without organic materials other applications were of little value.[65] He warmly advocated the spreading of manure as a top dressing in contrast to Taylor's insistence upon the immediate plowing under of all manure to prevent evaporation. Ruffin saw no danger from this source but thought that where manure was scattered upon the surface the warm spring rains carried its particles down to the roots of the plants at the very time when they would do the most good.[66]

He urged the growing of the southern cow pea and the adoption of improved crop rotations as a necessary part of improvement. Acquainted with the theory of removal of plant food materials and the theory of root excrements as an explanation for decline of fertility under constant crops of the same kind, he reserved his judgment as to the correctness of either.[67] Later he was inclined to question the absolute character of exhaustion by the removal of materials by the plant on the grounds that a restoring of organic matter alone, which does not contain all the minerals supposed to have been removed, will give an increased fertility. He also found serious objections to the toxic theory though he did not reject either as contributing factors to decline.[68] From a practical standpoint he knew that crop rotation was essential to improvement and suggested that an added reason for its use could be found in the increase of harmful insects, etc., where the crops upon which they feed were continually raised on the same ground. A good rotation as he saw it was one which gave largest profit, added most to the fertility of the soil and in which each crop prepared the ground for the crop that was to follow.

Ruffin did not condemn slave labor but saw no reason why in a moderate quantity it was not as capable of producing improved agriculture as was free labor. He realized that most planters had too many slaves but he insisted that it was the crops and the open methods of cultivation encouraging erosion and leaching, which had destroyed the agriculture in these states, and not the system of labor employed. He would reduce the number of slaves to the most efficient level but would not listen to the advocates of complete emancipation.[69]

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[64] William Crocker, *Gypsum as a Fertilizer* (MSS).

[65] Ruffin in *Southern Planter*, VI, 135-44.

[66] *Ibid.*

[67] *Farmer's Register*, VII, 609-10.

[68] *Farmer's Register*, VII, 609-10; *Southern Planter*, XII, pp. 289-305. Ruffin reached these later conclusions by 1852, *Ruffin Diary* (MS).

Going deeper into the problem he insisted that the proportional political and economic decline of the south was purely a matter of the exhaustion of the soils. Had the original productivity of the lands remained, southern population would have been held at home and the increase would have been equal to that in other parts of the nation. Southern representatives in Congress would have thus been large enough to have checked injurious legislation, such as tariffs, prohibition of slave extension, etc., and the South would have continued to prosper and hold her own in national affairs. A declining fertility of soil had produced a declining population and its attendant ills. The way out was to remove the cause. To that end Ruffin labored.

His conception of fertility was thoroughly dynamic and not static. He believed that the soils which had once been fertile could again be profitably brought back to a high degree of productivity through the correction of acidity, the addition of organic matter, the laying of deep drains, and the use of proper crop rotation and methods of cultivation.[70] He combined with a scientific approach to the problem an almost intemperate love of his section and its institutions. His efforts at restoring the fertility of the soil were backed by the zeal of a patriot—in fact, almost the ardor of a fanatic. The end to be achieved was more than the mere increasing of material gains.[71] The South was to be restored to national leadership or to become a prosperous independent nation.

[69] *Farmer's Register*, IV, 98, quoted from *Essay on Calcareous Manures.*

[70] *An Address on the Opposite Results of Exhausting and Fertilizing Systems of Agriculture*, read before the South Carolina Institute at its Fourth Annual Fair, Nov. 18, 1852, by Edmund Ruffin; *Diary*, 1858-59; *Southern Planter*, XII, 329.

[71] The story of Ruffin, the Southern Patriot, and his part in the movement toward secession is as yet an unwritten story. His aims in southern agricultural improvement were to build up a section as against a rival and he used his agricultural influence toward political ends.

The results of Ruffin's work, especially in the tidewater section, were highly gratifying. In the course of two decades the entire face of the region was completely transformed. Decline was checked and agriculture was declared to be "steadily and progressively advancing" with the use of marl upon the soils.[72] "Where marl is introduced," writes one farmer, "we hear no more of turning out land or of emigration to the West." From 1838 to 1850 the values of land in tidewater Virginia alone increased by over seventeen millions of dollars and those of lower Maryland proportionally.[73] One estimate of the time placed the total increases in land values in the region in the period from 1828 to 1850 at over thirty million dollars.[74] And the official statements give the credit for the increases largely to the use of marl.

A few specific cases of improvement will show what marl and its accompanying improvements were doing in the way of altering the soil. Ruffin himself almost doubled the yield of his lands at Coggins Point in the period from 1813 to 1825, lifting the yield of wheat from an average of 5⅓ bushels per acre to 10½ bushels.[75] On his Marlbourne estate he added 276,613 bushels of marl and increased his returns from a loss the first year (1844) to a profit of 20 per cent at the end of the fifth year. The marl added and the drainage system instituted caused the lands to grow in fertility from year to year, yielding in 1858 over 6,000 bushels of wheat where in the earlier years the average had never been more than 627 bushels. The wheat rose from 14.75 bushels to the acre in 1844 to 20 bushels in 1848; the corn yield rose from 14 bushels to the acre to 28.12. The cash profits changed from a seventy-five dollar loss the first year to gains of from $2200 as a minimum to over $6300 as the maximum.[76]

Carter Braxton at Newcastle Farm increased his yield of wheat from 5 bushels per acre to over 15 bushels in a period of

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[72] *Report of the United States Commissioner of Patents for 1843-44*, p. 24; *Farmer's Register*, X, 383.

[73] E. Ruffin, *op. cit.*; *American Farmer*, I (new series), 283. Lands in eastern Maryland more than doubled, II, 290.

[74] E. Ruffin, *op. cit.*; *Southern Planter*, XII, 258; *Farmer's Register*, X, 489-90, estimates that marl increased values in King William County (Va.) in 1842 by $483,000; crop increase of year by over $31,230.

[75] *Farmer's Register*, VII, 114; *American Farmer*, III, 313-19.

[76] *Southern Planter*, IX, 226-27; *Edmund Ruffin Diary* (MS).

13 years and his corn yields from 18 bushels to 50 bushels.[77] William Hambleton in lower Maryland took a farm covered with pine thickets in which the old corn ridges of earlier cultivation were still visible, and lifted the yields of wheat from 115 bushels total to over 1490 bushels, and the corn yields from 85 bushels to 520 barrels in the course of some twenty years.[78] In James City County (Va.) the crops of corn were doubled by the use of marl;[79] in Hanover County the results were even greater,[80] as also were they in Talbot County[81] (Md.); around Williamsburg in Virginia, the crops were doubled and quadrupled and the values of the land increased proportionally.[82] Even the attendance at William and Mary College showed the new prosperity which had come to the section by an increased attendance from 17 in 1833-34 to 140 in 1839-40.[83] The stories of changes in Prince George County (Va.) and other eastern counties in both states often read like fairy stories. Fields once galled and gullied were now growing rank with clover; lands once abandoned, now brought forth abundant yields of wheat and corn. A former resident of the tidewater district who had left a region of "poverty stricken fields" and "fleeing emigrants," returned to the land of his nativity in 1834 to find the face of the country altered by the use of marl. Luxuriant corn had taken the place of "scanty hen's grass" and even the people had been awakened to a new spirit of industry and improvement.[84]

The wide use of marl like the development of internal improvements and better markets was thus a fundamental step toward the reorganization and establishment of agriculture. Obstacles that had prevented success were now being removed and the way opened for a better and more permanent system of farming. The forces working for improvement were again being slowly let loose and the way better prepared for their success.

Although Edmund Ruffin's work was more important than that of any other single individual, it must not be inferred that he worked alone in these early years for improvement. Other men and other agents were doing their part and other means than marl were being used to reclaim the soil. The improved practices of the earlier period had lost ground but they had not been entirely abandoned. Under the new stimulation these practices tended to spread and improve. The great agricultural journal of earlier period—*The American Farmer*—had been weakened by the reaction but had not given up its struggle for improvement. John Skinner had ceased to be the editor and even the name of the paper had been changed to the *Farmer and Gardener*, but its pages still told of efforts at progress and it still kept faith in the possibility of reclaiming the exhausted lands.[85] This paper was to Maryland, and in the twenties to all the section, what the *Farmer's Register* was to Virginia in the next decade.

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[77] *Ibid.*, XIV, 104.

[78] *American Farmer*, XIII, 201, 249.

[79] *Farmer's Register*, I, 108.

[80] *American Farmer*, XI, 9-10.

[81] *Field Operations of the Bureau of Soils* (U. S.), IX, 226-37.

[82] *Farmer's Register*, VIII, 415-18.

[83] *Ibid.*

[84] *Ibid.*, I, 606.

The agricultural society had dwindled "like other things agricultural," but by 1840 many had gotten back into working order and were taking a hand in the attempts at bettering conditions.[86] The transition to a new agriculture was the work of many agents who believed with Edmund Ruffin that this section "as well deserves as the rich west itself to be the object of speculators, treasure hunters, and builders of castles in the air."[87]

Progress was at first slow but by 1830 signs were not entirely wanting that a new awakening was at hand. In 1834 a writer observed that "the high prices, and facilities of transportation, stimulating to increased production, have aroused a spirit of improvement . . . and the minds of many hitherto indifferent to the subject are now directed to the resuscitation of their exhausted fields."[88] Travelers began to notice the arousing "of the hitherto dormant feelings of lower Virginia," the movement to better plowing, a wider use of manure, and the passing of the denuded and gullied hillsides.[89] Building upon the better transportation facilities, markets, and soils, there was a return to the better practices of the former period and a rejection of most practices that had characterized the old extensive agriculture.

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[85] E. P. Roberts edited the *Farmer and Gardener* after Skinner had sold the *American Farmer*. See *American Farmer*, VII, 325.

[86] *Farmer's Register*, II, 317, 521.

[87] *Farmer's Register*, III, 754.

[88] *Farmer's Register*, I, 608 (March, 1834).

[89] *Ibid.*, I, 93,263, 265. ("A new era approaches.")

Again we hear the condemnation of tobacco growing, the overseer system, and the heavy tying-up of capital in lands and labor.[90] With the increasing sale of negroes to the lower South, many escaped the burden which had prevented improvement, and with a lessened number of slaves, a personal supervision of all labor, and a more careful organization and division of the tasks to be done, found slave labor to be a success in improved farming. Such men as Richard Sampson, Hill Carter, John Selden, William B. Harrison, Willoughby Newton, etc., fitted their slaves into the new work and even the small farmer like J. H. Turner, by careful buying and personal attention, found profit and improvement with a limited number of slaves.[91] A new interest developed in deep and horizontal plowing; lime and plaster, in the growing of clover and other grass crops, were again widely proclaimed and practiced; and most important of all, the production of barn-yard manure for use equally upon all lands, became the object of men everywhere.[92] Even in the regions where tobacco culture still continued because of distance from markets, there was a decided tendency to improve the methods of cultivation and to introduce a system of crop rotation in which wheat and clover alternated with tobacco.[93] In the grazing sections also, leading farmers tended to diversify their production and give less attention to cattle.[94] In short, the small farm and diversified crops, produced by careful cultivation, in scientific rotation, were now the ends to be desired. The reaction against good practices was now at an end and a saner and more intelligent understanding of their proper uses spread out from those places where they had not been abandoned.

Yet not all or perhaps even the major part, was on the mend. Emigration was still going on and the nation-wide depression of the late thirties and early forties was accompanied in this section by a general lowering of the wheat yields. Climatic conditions combined with rust, the Hessian fly and other pests, to bring disaster. This was more serious in the face of the fact that other major crops were not as yet well enough developed to allow a rapid turning about in production.[95] Many had made a trial of cotton but it had not proven well suited to the needs of the section and had, except in a few spots, been abandoned.[96] In the late thirties a great interest developed in the raising of silk worms with the idea of making this an important part of the agricultural efforts of the section. Large amounts of capital were invested in stock and buildings, only to bring losses when the unsuitableness of the climate had brought ruin year after year to the farmers.[97] Such failures slowed down progress and checked a movement that was sound and capable of permanent benefit. Yet on the whole things were moving forward and better methods and more suitable crops were gaining a following. Profits were more steady and temporary failure did not bring permanent stagnation. There was scarcely a neighborhood in either state that by 1840 did not have its share of men who were farming less land in a better way and finding that it brought better returns than the old system of extensive monoculture. The agricultural journals of the period are filled with letters from the different counties telling of the use of "tenfold more manure" than ever before; of the wider use of gypsum and lime; of men who "work well . . . plough well . . . and cultivate well," and of neighborhoods were every farm is in an "improving state."[98]

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[90] *Ibid.*, II, 284-86; V, 187-88; I, 524.

[91] Edmund Ruffin, *op. cit.; Farmer's Register*, X, 127-30, 150-58. Mr. Turner is one of the most interesting small farmers of the period, his handling of slaves being of particular interest.

[92] *Farmer's Register*, IV, 5-6, 547-49; III, 611-12, 186; I, 33.

[93] *Ibid.*, II, 601-2; IV, 375-77, 385-86.

[94] *Ibid.*, II, 138; IV, 4-5, 5-6, 129-30; V, 36-37. (Note use of manure with gypsum.)

The census of 1840 shows heavy grain production throughout this entire section. Corn, wheat, and oats were quite generally raised but centered in the western portion of Maryland, and in the middle and western counties of Virginia. Grazing was mixed with the cereals in the western counties and corn production predominated in the more eastern ones. Cotton had some hold in the Roanoke section and tobacco, though raised quite widely, centered especially in lower Maryland and south central Virginia. Market gardening had begun around the cities and in parts of the tidewater. The dairy was making some headway around Baltimore and Washington, though as yet the proportions were small. Improved breeds of cattle were being introduced and the number of cattle in the grain growing sections was especially noticeable.[99] In general it may be said that by 1840 the future lines of development were well marked out and a system of diversified farming established that brought with it new methods that improved rather than exhausted the soil. The significant fact is that it had been demonstrated that soils once impoverished could be restored. Lands once abandoned could be made to yield crops that would bring profits. Confidence took the place of despair and the future condition of the soil became an item in the choice of methods employed. Where once men had refused to adopt proven means toward better farming, fakirs were now going around the country selling "wonderful corn and wheat seed," or patent manures, to an eagerly purchasing public.[100] The way was thus prepared for the ready adoption of new fertilizers and the spreading of better methods.

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[95] *Farmer's Register*, V, 539, 546.

[96] *Ibid.*, V, 5-6; C. H. Ambler, *Sectionalism in Virginia*, p. 115; *Report of the Commissioner of Patents* (U. S.), for 1847, p. 379-81.

[97] *Farmer's Register*, VI, 378-79; VII, 60-62, 380-88; VIII, 36-39, 379-80, 510-11. Virginia was the chief section for effort at silk-worm production.

[98] *Farmer's Register*, VI, 2-3, Liming on East Shore of Maryland; V, 460, Amherst improvements; W. Faux, *Memorable Days in America*, p. 149, 50, Profitable farming in Maryland; *Southern Planter*, III, 217, Reclaiming worn lands; *Farmer's Register*, IV, 577-79, Profits in Virginia; *ibid.*, IV, 260-61, Improving worn lands in Virginia; *ibid.*, II, 233-38, Albemarle improvements; *ibid.*, II, 675-79, Henrico Co.; *ibid.*, V, 362-64, Goochland; VI, 178-91, etc.

With the recovery from the depression in the early forties the general course of agriculture in this section tended to move upward. There were no boom periods and slack times still returned, yet the general note was one of progress. External conditions were on the whole favorable. The tariffs which had caused so much complaint in the twenties were now more favorable to agriculture and the state governments more inclined to give aid to the farmer.[101] State agricultural boards were organized, state agricultural chemists employed and steps taken toward the establishment of agricultural schools.[102] Markets at home improved and European wars opened up broader markets there to supplement the growing demands of South America and the West Indies.

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[99] *Farmer's Register*, V, 377; *Farmer and Gardener*, III, 386-87.

[100] *Farmer's Register*, VI, 47-53. Note also sale of Bommer manure receipt; even editor of *Virginia Planter* became an agent for this.

[101] Compromise tariff had reached a low rate by 1840 and the tariff of 1842 gave way in 1846 to the Walker tariff which "squinted" strongly at free trade.

[102] Virginia appointed an Agricultural Board in 1841, Mch. 20. Its duties were to investigate and report agricultural conditions to the legislature. Board failed because of no provision for pay but it did some good work in

The way was therefore prepared for a favorable reception of any new agent of improvement. The *Southern Planter* now came forward to furnish Virginia with an agricultural journal and John Skinner returned for a brief time to the restored *American Farmer*. The *Southern Planter* was an experiment in furnishing a cheaper farm paper and its editor, C. T. Botts, undertook at the low price of one dollar a year to "collect, examine, select, and report to his readers in a clear, simple and condensed style," all the latest agricultural information. The very nature of the paper indicates the character of the new agricultural interest to which it was catering. Skinner did not long remain with the *American Farmer* but it nevertheless took on new life and became again the great organ of the improved farmer in Maryland. Both papers flourished, comparatively speaking, and were able to continue, under different editors, up to the opening of the Civil War.[103]

A second factor of greatest importance was the introduction and wide adoption of the use of Peruvian guano. Coming in at a time when faith in fertilizers was at its height and when restoration offered good returns, it played a part in rejuvenating the soils even greater than that played by marl. Where marl had been effective only in limited areas, guano was quite universally beneficial and could more easily be shipped to the interior sections. So great were its results from the very first that its introduction

arousing new interest in improvement. The Virginia State Agricultural Society was reformed in Feb., 1845, and through its fairs, etc., was a force toward better things. *Southern Planter*, I, 43; V, 43-45; *Farmer's Register*, IX, p. 239-40, 688-90, 274-82. Edmund Ruffin acted as Agricultural Commissioner for the Virginia Agricultural Society for a time and made trips of observation in interest of same, *Southern Planter*, XIV, 154, 225; XV, 5. Maryland employed a chemist, 1847, and in 1855 took steps leading to an Agricultural College, and on August 24, 1858, corner stone laid.

[103] *Southern Planter*, issued January, 1841, from Richmond (Va.). Skinner returned to the *American Farmer* in 1839 but in 1841 was appointed Assistant Postmaster General. These papers were back of every good move in both states. The *American Farmer* worked for the revival of agricultural societies in Maryland and the revival of the fairs there was ever encouraged and given largest publicity, *American Farmer*, IV (4th new series), 184; II (new series), 265, etc. It worked for the state chemist and the Agricultural College also.

was hailed as the beginning of a revolution in which "all the worn-out tobacco lands in Maryland and Virginia . . .will . . . become converted into the most arable and productive soils in the country." In fact, it was thought that "this article, Guano," would, "transfer the Western lands to the Atlantic."[104]

In the early twenties a small sample of guano had come into the possession of John Skinner and was given some notice in the pages of the *American Farmer*.[105] But the times were not then ripe for its use and no permanent results followed. It was not until its benefits had been proven in England that it received a new trial in the United States. In 1843 a ship load was imported to Baltimore and sold out at seven cents a pound in small quantities for trial.[106] A portion of this shipment reached Virginia but by far the larger part was put to test in the regions around Baltimore. The results were in most cases satisfactory and a widespread interest was at once aroused in this new soil restorer. Articles were copied from English journals and letters published from those who had been fortunate enough to secure a share from the early shipments. Guano was, indeed, as the editor of the *Southern Planter* said, "the prominent subject of the day." The shipments to Baltimore increased rapidly, rising from 445 tons in 1844 to 25,500 in 1852. After 1852 other ports received shipments and Norfolk and Alexandria became distributing centers for Virginia and farther south. Baltimore, however, continued to be the heaviest receiving port and her consignments rose to 54,134 tons by 1860.[107]

In spite of the government monopoly which Peru maintained, and the consignment system by which all importations were made—both causing the price to remain high—guano increased in importance during the fifties and only on rare occasions did the supply equal the demand. So basic in the new agriculture did it become that the state governments provided for its inspection and, urged on by conventions and individual petitions, passed resolutions demanding action on the part of the central government in making better terms with Peru.[108]

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[104] *Price Current*, Sept. 14, 1844.

[105] *American Farmer*, VI, 316-17.

[106] *American Farmer*, IV, 236 (new ser.); *Southern Planter*, III, 196; *American Farmer*, II (ser. 4), 331; IV (new ser.), 14; *Farmer's Register*, IX, 556; *DeBow's Review*, XIV, 471.

[107] *DeBow's Review*, XIII, 627-30; *Price Current*, annual statement for 1852; F. R. Rutter, *op. cit.*, p. 43 ff.; *American Farmer*, XII, 1-12 (new series): *DeBow's Review*, XIV, 471.

After 1850 guano from other countries was imported and the United States government urged searches for deposits along our own coast. Guano had become a fundamental factor in the new agricultural revival of this section and its use was limited only by the amount that could be secured and the capital with which to make the purchases. Men sought it with the same fervor with which they sought gold in the west in this same period and its effects on worn-out lands seemed to justify their zeal.[109]

As had been the case with marl, the effects of guano on some soils was almost miraculous. Crops were often doubled and the values of lands doubled. Wheat as well as other crops were greatly benefited and many who had failed to profit by the use of marl now tell of worn lands restored to a new fertility by the application of guano. "Old fields . . . blooming and producing with something like their pristine fertility, . . . the barren wastes of the last generation . . . becoming smiling fields, groaning with yellow harvest, rich meadows waving with sweet-scented grasses,"— these were the things that caused men to believe that "the last 'old field' would soon yield to the onward progress of agricultural improvement."[110]

Nor had marl ceased to work its wonders in certain sections. In all the lower counties where supplies of marl were at hand it was being applied with great benefit. The average yield of corn with marl had been raised about eight bushels to the acre and the average of wheat about four, while the land values as has already been noticed, were increased nearly 200 per cent.[111]

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[108] *Southern Planter*, X, 150; F. R. Rutter, *op. cit.*, pp. 39-43.

[109] *Report of the Commissioner of Patents*, 1848, p. 469-70, "The effects realized by the application of guano have been so favorable on a great portion of our worn out lands, as to create almost as great a fervor to procure it as appears to affect some sections of country at the present time in regard to the gold region of our newly acquired territory." *DeBow's Review*, XXVII, 282 (effects of guano in restoring wheat in Northern Neck of Virginia); *Report of Commissioner of Patents*, for 1850, pp. 252-55, wheat and guano in Spottsylvania County, etc.

[110] Quoted in *DeBow's Review*, X, 652-54.

[111] "Report to the State Board of Agriculture on most Important Recent Improvements of Agriculture in Lower Virginia," *Farmer's Register*, X, 656-66, June 30, 1842; *Monthly Journal of Agriculture*, II, 277-78 (tells how Talbot County (Md.) transformed and filled with "cultivated cultivators.")

Lime and bone were also being applied with benefit and gypsum as a means to clover was widely employed. Lower Maryland had found that gypsum would enable clover to grow in that section and lands in Prince George, Anne Arundel, Calvert, Charles and St. Mary's Counties rose in value and emigration checked as this fact became more widely known.[112] Gypsum had never been surrendered in the western and central counties of either state and clover was a permanent part of the rotations in all the great grain counties. But it was not used alone. Manure was everywhere an object and the greatest care was being taken to preserve the liquids as well as the solids from the increasing supply of cattle and other stock.[113] A few were protecting their manure piles from the rain and urging others to do the same so that the greatest benefits might be secured from its use. It is also interesting to note that the value of blood and other garbage from the butcher shops was understood by a few and was being advocated by them as a means to "renovate soil."[114] Vegetable manure was also widely employed and leaves from the forest as well as regular field crops were being plowed under upon "worn lands" as a means of bringing them again to productivity.[115] Liebig's work was well known in the section and superphosphates and other artificial fertilizers were being manufactured at various places in the states.[116] Men were convinced not only that the soils could be restored by means at hand, but that it was cheaper to use these means to secure a productive plot of ground than to cut and grub even the primitive forests.[117] In guano, lime, marl, vegetable and animal manure, etc., when combined with good plowing and scientific crop rotation, were found the means of lifting unproductive lands to a new fertility. The ills of monoculture, producing soil diseases, toxicity, etc., and the removal of available plant food materials without replacing them, were now things quite largely of the past. Erosion was still a source of trouble but even this had been partly checked.

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[112] *American Farmer*, I, 283 (new ser.); *Report of Commissioner of Patents* 1850, p. 344-48; *Farmer's Register*, VII, 209.

[113] *American Farmer*, II, 12 (new ser.); *Report of the Commissioner of Patents* (U. S.), for 1850, pp. 344-48, 442-49; *Farmer's Register*, X, 34, 87; *Southern Planter*, II, 15-16; VI, 49-50; XVII, 257-65.

[114] *American Farmer*, II (new ser.), 297-99; VIII (4th ser.), 1-8; IV (4th ser.), 129-34. The prize essays of the *American Farmer* will show that they understood the use of fertilizers very well. Also, *Southern Planter*, VIII, 336-41.

[115] *Farmer's Register*, X, 83-85. Oats used as green manure. Cow peas heavily used, see E. Ruffin, *Essays and Notes on Agriculture*, p. 368-76.

[116] *American Farmer*, IV (4th ser.), 234, 258, superphosphates manufactured at Richmond, etc.

[117] *Southern Planter*, XIV, 19-20; V, 221; *Farmer's Register*, VII, 153-55; Address of Franklin Minor to Albemarle Agricultural Society, 1846.

A further factor in the new agriculture was the continued improvement of farm machinery. The plow was now in a high state of perfection and subsoil plows were being widely introduced. Gideon Davis of Georgetown had early made subsoil plows and by 1845 various makes were being used in both states.[118] Deeper plowing, and plowing so as to prevent washing on hillsides, were the general practice and the old washing of lands is less heard of than in earlier days though it was ever a problem. The reaper had come with the heavy production of wheat and both Hussy and McCormick had begun their work in this section.[119] Improved drills for grain were used and improved machinery for spreading guano and other fertilizers were being utilized. No better comment could be made on the state of improvement in this section than to note the large number of the truly important agricultural implements that had their origin or development in this section and in this period. It is not far from the truth to say that Virginia and Maryland did more for the improvement of the methods and machinery of grain production than any other portion of the nation. From the plow to the reaper they were in the lead and in the application of fertilizers and the understanding of their best uses they rivaled the famed farmers of Pennsylvania.

After 1850 particularly, Virginia and Maryland entered into the fullest fruits of the new methods and improvements. Their agriculture was thoroughly diversified or specialized for special markets. The whole system was upon an improved basis and lands were not only being kept at a high state of productivity but worn lands were everywhere being made to yield abundant crops. As a speaker declared before the Rappahannock Agricultural Society in 1854, "Ten years have wrought a mighty revolution in the fortunes of Virginia. A new era has dawned on our noble commonwealth and henceforth her march is onward. The noblest victory of modern times has been achieved. . . ."[120] Virginia had seen the error of relying on a single product for profits and as William B. Preston told the Virginia State Agricultural Society, "In the variety and diversity of our crops, security . . . profit, and wealth will . . . be attained."[121] And Maryland had done even better than Virginia. In every part of the state improvement was manifest. The western counties were models of diversified farming, where crop rotation, the use of manures and fertilizers, etc., were being practiced and the lands were being improved. The neighborhoods where Washington's correspondent in 1797 had reported a yield of 10 bushels of wheat to the acre, now showed from 15 to 20 bushels and often higher.[122] The tidewater regions were quite generally improved and their crops either specialized or diversified. Lime, marl, guano, bones and ashes, were widely used and clover found a place in most rotations. The agricultural society was again alive and active, a state chemist made soil surveys and advised the farmers on the proper crops and fertilizers, and in 1854-55 steps were begun toward the establishment of a State Agricultural College and Experimental farm—one of the very first institutions of its kind in the country.[123] Improved machinery of all kinds had been adopted and owners were giving personal attention to the cultivation of their lands and concentrating their efforts upon smaller units. The term "worn-out land" was going out of use and prosperity was general.[124] The products of the new agriculture were the specialized farmer producing special crops for special markets and the diversified farmer, with his varied crops. The former are well illustrated in the market gardener and the dairy farmer. Market gardening for northern markets had begun early in eastern Virginia and production for the Baltimore market had begun as early in Maryland. In 1835 farmers in Nansemond County (Va.) were shipping sweet potatoes and watermelons by the vessel load to northern ports,[125] and a few years later Irish potatoes for the early markets at Baltimore and Boston were being purchased by the northern buyers at these landings.[126] Truck gardening began in the Norfolk district in the early forties and great quantities of peas, strawberries, tomatoes, cucumbers, potatoes, cabbages, etc., were sent to Baltimore, Philadelphia, New York, and Boston. One source states that on May 17, 1859, 600 bushels of green peas and 500 quarts of strawberries were shipped to Baltimore and 400 bushels of peas to Boston.[127] In 1853 a traveler saw one strawberry field of 15 acres with from 110 to 200 pickers; one farmer who had planted 1200 bushels of Irish potatoes; and in other places "acres and acres of tomatoes, cucumbers, potatoes, etc., all for the northern markets."[128] Olmsted tells of the truck gardens reaching out in every direction from the town of Norfolk, offering a decided contrast to the old-fashioned farms among which they were situated. He quotes from the local newspaper to the effect that from 2,000 to 2,500 barrels of potatoes and from 300 to 500 barrels of cucumbers, etc., were being shipped to Philadelphia and New York.[129] In June and July 1857, over 96,000 packages containing peas, cucumbers, beans, potatoes, tomatoes, etc., and valued at over $240,147 were shipped from Norfolk to New York, Philadelphia, Baltimore, and Richmond. At the same time over 33,000 watermelons were shipped by the daily line of boats that ran to Baltimore and the semi-weekly line that went to Philadelphia and New York.[130] The United States Census shows the value of truck garden produce in Virginia to have risen from $92,359 in 1840 to $183,947 in 1850 and $589,467 in 1860.

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[118] *Southern Planter*, XIV, 19-20; V, 221.

[119] *Farmer's Register*, IX, 129; VII, 455-56; *Wisconsin Historical Society Proceedings*, 1908, p. 234-59 (Sketch of McCormick).

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[120] *American Farmer*, IX (new ser.), 343-47.

[121] *Southern Planter*, XIV, 353.

[122] *The Plough, the Loom, and the Anvil*, II, 355-61; *First Report of Philip T. Tyson, State Agricultural Chemist to House of Delegates of Maryland*, Jan., 1860, p. 133; *Address of W. W. Bowie before the Valley Agricultural Society of Virginia*, Oct. 22, 1852.

[123] *Geology of Maryland*, Higgins and Tyson, 1850-1862; *Report of James Higgins, State Agricultural Chemist to the House of Delegates of Maryland*; see also *Second Report of J. Higgins* . . . etc; *American Farmer*, X (4th ser.), 97. The Agricultural Society fathered the move for an Agricultural College, and shares were subscribed. The Legislature gave aid and building began in 1858, *American Farmer*, XIV, 65.

[124] *First Report of Philip T. Tyson, State Agricultural Chemist of Maryland, 1860.*

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[125] *Farmer's Register*, IV, 525-28; X, 335-39, sweet potatoes for northern markets in Elizabeth City County.

[126] *Report of Commissioner of Patents*, 1848, pp. 493-97.

[127] *Field Operations of the Bureau of Soils* (U. S.), 1903, p. 234.

[128] W. H. Richardson to H. P. Pleasants, *Southern Planter*, XIII, 210.

[129] Frederick Olmsted, *The Cotton Kingdom*, I, 153-54.

[130] *DeBow's Review*, XXIII, 413-14.

In Maryland truck gardening prospered especially in Anne Arundel and Baltimore Counties, with the cities of Baltimore and Annapolis as the chief markets. Along the Patispco River over 600 acres were in strawberries, and over 20,000 bushels of berries were gathered in 1857.[131] Vegetables were grown in large quantities and many farms had as high as 25 and 30 acres in cabbages. Maryland's truck garden produce rose in value from $133,197 in 1840, to $200,869 in 1850, and $530,221 in 1860.

But not all the specialized farmers were truck gardeners. Many found profits in the dairy. Near Baltimore and Washington were farmers who kept good breeds of cattle and sold milk in the cities; some specialized in other crops, such as hay and sold their produce to the livery stables in the city; others raised fruit or sold cider from their orchards; some raised hogs and some chickens.[132] Many began on abandoned lands and by the use of artificial fertilizers or manures hauled from the city, lifted their lands to high fertility and their profits to comfortable limits. One dairyman made from $4,000 to $6,000 annually; another from fruit and pigs made over $1,113; while a third boasted of the sale of many fine blooded boars which brought him over $55 each.[133]

Tobacco, in a sense, was also a specialized crop in this period. Western competition ran heavily after 1840 and the eastern planter was forced to lessen his crop and improve his methods. Many turned from tobacco planting altogether while others began the use of guano or other fertilizers in an effort to make greater crops. New ways of curing tobacco were introduced and old checks on lower grades of tobacco were removed.[134] Prices after the fifties were good and tobacco increased both in its special districts and as one of the crops in a diversified system. Yet it was not the exhausting crop of old, for the use of fertilizers and rotations made it possible to produce the crop without destroying the fertility of the soil.

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[131] *American Farmer*, XIII (4th ser.), 19-20.

[132] *Farmer's Register*, VII, 153-55; F. L. Olmsted, *A Journey in the Seaboard Slave States*, pp. 5-11; *American Farmer*, IV, 9 (4th ser.); *Farmer's Register*, X, 127-30, 150-58.

[133] *American Farmer*, IV (new series), 9; *Farmer's Register*, X, 127-30, 150-58; VII, 153-55.

[134] *Southern Planter*, VIII, 209-10; Olmsted, *The Cotton Kingdom*, I, 88-89; *Report of the Commissioner of Patents*, 1847, pp. 374-76; *Southern Planter*, I, 253; IV, 108; *Farmer's Register*, X, 32; *United States Census*, 1840, 1850, 1860.

The diversified farmer was the other product of the new agriculture. He was sometimes the small man who now held his own against the larger owner and he was sometimes the larger farmer like those along the James or Rappahannock Rivers. The decline of wheat in the early forties, though in part remedied by the use of guano, helped to further diversify agriculture. Several cash crops were found better than one and the ability to shift the cash crop or to scatter it among several products was a decided advantage. Wheat was, as a rule, a good crop, especially with the opening of the Crimean War. Yet wheat rust and the fly were always to be feared. It is interesting to notice, however, that some men had begun to suspect that the barberry bush was the carrier of wheat rust and that new kinds of seed were being tried to check the pest—both things indicating an agricultural intelligence well ahead of the times.[135] Tobacco and corn also had periods of advantage and there was ever an opening for the sale of stock of various kinds. The diversified farmer made a place for all of these as well as the produce of the orchard and garden. Better breeds of cattle and hogs had been coming into the states for a number of years and the Agricultural Fair of the period found almost all the standard breeds on exhibition.[136] The agricultural journals of the day contain advertisements of fine stock for sale and notices of stock being imported from abroad are not uncommon.[137] Rockbridge and other western counties in Virginia drove "vast herds of beeves" to the markets at Richmond, Baltimore, and Philadelphia,[138] while interior counties like Albemarle, were securing western cattle in great numbers and fattening them for market at those points or farther north.[139] Most farmers, however, simply adopted the raising of stock as a part of their general farming, both as a means to a larger supply of manure, and as one of the cash products.

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[135] *Southern Planter*, IV, 233.

[136] *Farmer's Register*, IX, 634-36.

[137] *Southern Planter*, I, 29, 69, 101, 104; *Farmer and Gardener*, III, 386-87; *Farmer's Register*, V, 377.

[138] *Report of Commissioner of Patents*, 1851, Part I, pp. 282-85; *DeBow's Review*, XVIII, 59-60.

[139] *Southern Planter*, X, 161-62. Over 2,000 cattle driven from west and fattened in Albemarle in 1850.

A splendid idea of the life and system of the large diversified farmer can be secured by a study of the *Journal of John A. Selden* of the famous old Westover estate.[140] Like most of the farmers on the James, Selden used the four field system of crop rotation consisting of wheat on clover the first year, followed by corn the second year, wheat and oats the third, and clover turned under by deep plowing in the fourth year.[141] He used lime and gypsum and spread great quantities of manure over his fields. He used a good four-horse plow for preparing his ground and plowed in the fall so as to fallow it over for the spring crop. Later he changed his system, raising corn peas, wheat, clover and wheat, in order. A few items directly from the *Journal* during the course of a year, (1858-59) will show the great diversified farmer under the most favorable conditions.[142] On August 9th we find him delivering 1050 bushels of white wheat, and on the next day cleaning and delivering 1010 more. His total crop of wheat was 4250 bushels, an average of 21¼ bushels to the acre. He shipped it by boat from his own landing to Richmond and received a cash payment of $5,360.10. The wheat crop out of the way, we find him on September 29 beginning his fallowing and rolling and scattering straw on his clover for next year's corn crop. On October 5, he went to Richmond to attend the executive meeting of the Virginia Agricultural Society, and on the 26th, to attend the Fair of the United Agricultural Society. Early in December he was butchering his hogs, sowing plaster on his fields, and burning brush on new ground. The hogs killed, weighed 8,561 pounds and at different times during the winter he was selling hams and bacon in the Richmond market. In April he cleaned his clover, hauled out his hog manure, and spread lime on his fields. Later he made use of all the kitchen manure, ashes, etc., by spreading them on his corn lands, and then applied his barnyard manure to his lighter lands. Plowing, manuring, planting, shearing sheep, weeding and thinning corn, with occasional trips for business or court, carried him around again to the wheat harvest. He used machinery of all kinds in his work and gave personal supervision to the carrying on of his estate. Slave labor was largely employed but during harvest or other times of pressure hired labor from the outside was brought in, showing that the oversupply of slaves, once so common, was no longer tolerated. The returns from agriculture were large and an ample style of living possible. The diversified farmer was more prosperous than the tobacco planter had been after the first years of the seventeenth century.

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[140] *The Westover Journal of John A. Selden* (*Smith College Studies*, IV, 253), edited by J. S. Bassett.

[141] *Farmer's Register*, X, 169-72; VIII, 1-4.

[142] *The Westover Journal of John A. Selden* (*Smith College Studies*, IV, No. 4). Page references are not given since combinations have been made from several pages in securing a summary. See other examples given in U. B. Phillips, *American Negro Slavery*, Vol. I, pp. 230-33.

The small diversified farmer differed from the great owner only in the size of his undertakings and in the size of capital invested. He was, as a rule, on poorer land and his task of improvement was heavier. Yet his crops were much the same and his wheat, corn, tobacco, hogs, and orchard or garden supplies gave him a comparatively comfortable income and enabled him to restore and keep his lands in good heart. He used less slave labor and often did without any. The use of clover, manure, guano, marl, lime or other fertilizer was at the bottom of his prosperity and he made use of the new farm machinery as widely as his resources allowed. Such counties as Fauquier, Loudoun, etc., in Virginia, and Montgomery, Frederick, and Washington, in Maryland, where he held sway, led the section in the cereal crops and in some years produced well on to a million bushels of wheat and even more of corn. The old advantage of the great farmer over the small had, to a degree, passed with the coming of general agriculture. Even the use of slave labor did not count heavily in the economic scale.

And what of soil exhaustion in the new period? The traveler could still see plenty of lands lying idle and grown with "briars, bushes, and a long, coarse grass of no value," and the local reformer could still find much to complain of in the practices of many of his neighbors.[143] Yet thousands of acres once in an exhausted condition had now been restored to productiveness. It was now known that lands could be improved and the methods of so doing were well understood. The new agriculture did not greatly exhaust. Erosion was now far less a problem with the better plow, the deeper plowing, covered drains, and the new methods of working on hillside lands.

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[143] F. L. Olmsted, *The Cotton Kingdom*, II, 38; "Address of Franklin Minor, to Virginia State Agricultural Society," Nov., 1855, *Southern Planter*, XV, 368-80.

The single crop was no more, and fertilizers to correct soil faults and give new fertility where cultivation made a drain upon the soil, were in common use. Men not only understood the importance of the proper chemical condition of the soil for highest fertility but also the mechanical condition as well.[144] The use of marl, gypsum, and other rock fertilizers was better understood and more widely practiced than in a much later day. Practically every fertilizer that the soil expert of the later period recommended for this section had been tried and found some use; the understanding of soil fertility and infertility was in many ways superior to that of the next generation and not far behind that of our own day. The tragedy of the Civil War grows with an understanding of the agricultural losses not only to this section but to the nation as a whole. In 1860 this section had much to teach to others, and most of that which might have been contributed was lost entirely. The good farmer of Maryland and Virginia in the decade from 1850 to 1860 had faced and solved problems greater than those presented to any other part of the nation and from him more could be learned of future importance than from any other farmer in the nation.

Under such conditions the abandoned fields of the old generation that still persisted did not cast gloom over the land or indicate decline. The traveler who did not know the past or understand the present was apt to misjudge conditions.[145] The ruins of the past hid the new progress from him and the changed attitude of the farmer—the most vital matter—was ever beyond his vision. An editorial from the *American Farmer* in 1859 well shows the new spirit: "Let it be understood that there is no such thing as worn-out land; that expression conveys a falsehood; it is a very practical thing, with a moderate degree of intelligence and no very large means, to restore these lands to any degree of fertility they have ever possessed. This lesson has been well learned in Maryland and a large portion of Virginia; but our Southern friends of the Atlantic States, judging from our exchanges have yet to learn it.

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[144] "Address of Franklin Minor to Virginia State Agricultural Society," 1855, *Southern Planter*, XV, 368-80, "More than a year ago I instituted a series of experiments with the view of testing the absorbent powers of the soil and subsoil of two adjacent spots in the same field, one of which was sterile and the other fertile. The result of the experiments, I think, demonstrated that there is a very important connection between the mechanical condition of the earth and fertility."

[145] I think Olmsted and others have done this.

Let them be told then everywhere, and constantly, that they have no worn-out lands—that in fact their lands were intended to last forever, and will last forever. . . . Let our friends tell their subscribers that here in Maryland we have tried all the alternatives, we have been 'down hill' and many have been 'West,' and have abandoned both one and the other for 'improvement' and know that that is the best thing."[146] Yet this is no blind declaration that soils could not be lowered in producing power, or rendered unfit for cultivation. It was the statement from those who had experienced all the ills of such conditions but who had now found ways of securing new fertility and of keeping the old.

Prosperity had enabled men to improve and improvement had increased prosperity. "Never have the farming communities found their labors better compensated than through a series of years past," says the *American Farmer* in 1857. "The consequence is a degree of comfort, freedom from pecuniary embarrassment, and of agricultural improvement in the enriching of lands, the building of comfortable country houses, etc."[147] The farmers in the northern neck of Virginia were declared to be the richest agricultural population in America, possessing along the river front an average wealth of nearly a hundred thousand dollars each.[148] The entire section was altered and its population enriched by the changes in agriculture.

Another result from these changes ought to be noticed. The new life that had come to Virginia and Maryland was more like that in the northern states than like that in the lower south. Even the Governor of Virginia advertised her agriculture as no longer "the large plantation system" but now one of "smaller horticultural and arboricultural farming."[149] Emigrants from northern states began to move into Virginia and Maryland as agriculture became like that of their own states. Settlers from New York, Pennsylvania, and New Jersey came singly and in groups to find homes in Fairfax, Dinwiddie, Norfolk, Surry and other counties in Virginia, and into Montgomery, Prince George, etc., in Maryland.[150] In one Virginia county over two hundred families from New York settled in the course of five years and invested something like $200,000 in farming lands.[151] The force of the agricultural system together with the inflow of northern settlers, was drawing the interests of Virginia and Maryland northward at the very time the new prosperity was binding the older and larger farmers more firmly to the southern type of civilization. Slavery had lessened in importance with the coming of diversified farming, yet on the larger estates it had fitted well into the system and new prosperity gave the owners a feeling that "emancipation (was) an idle dream," and that its accomplishment would overthrow "not only all the material interests of the South, but also the great fabric of modern civilization." These men were ready to let the institution "fulfil its mission," until "the same Power that opened the waters of the Red Sea . . . (should) make dry the waters of the great deep, for the passage of the African to his native shores."[152] The agricultural interests of the states were therefore divided and this agricultural division played its part in the struggle over secession and union in this section. As might be expected the line of cleavage ran rather closely along the line of interests based upon the new agricultural life—its markets, its labor, and its social relations.

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[146] *American Farmer*, I (5th ed.), 146.

[147] *American Farmer*, XIII (4th ser.), 1.

[148] *DeBow's Review*, XXVI, 269-70.

[149] Governor Wise, reply to M. Lacoutrie's letter proposing a French steamship line to the James, *DeBow's Review*, XXIII, 66-67.

It is thus apparent that by 1860 soil exhaustion had ceased to be a problem in Virginia and Maryland. The two states had come largely to the small farm and the small farmer. Even where the larger estate still persisted, extensive crops and methods had given way to intensive cultivation of diversified production. New markets had been found and a new prosperity established upon a restored fertility. The war between the states found the section far removed from the days when an exhausted soil limited her agriculture and sent her sturdy sons fleeing into the West.

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[150] *Report of Commissioner of Patents*, 1851, Part II, pp. 274-75; *The Cultivator* (N. Y.), VII, 154; VI, 91; IV, 77-78, 175; *Monthly Journal of Agriculture*, II, 287-88, 406; *Southern Planter*, VI, 145, 193; III, 66-67; II, 17-19; *DeBow's Review*, XXII, 621-23; Lyell, Sir Chas., *A Second Visit to the United States of North America*, I, 274.

[151] *The Cultivator*, VIII, 77-178 (March, 1847).

[152] Willoughby Newton to Virginia State Agricultural Society, Feb. 19, 1852.

CHAPTER V

SUMMARY AND CONCLUSIONS

From this survey of one phase of the agricultural development in Virginia and Maryland a few general conclusions may be drawn. In the first place, the part played by soil depletion in this section must be recognized as constant and important in shaping not only the course of agricultural development but of the larger social-economic order as well. Throughout the colonial period and afterward, agriculture was based upon a single crop produced by exploitive methods which caused yields to decline and lands to reach a condition in which the planters declared them "exhausted." Abandonment took place on a wide scale and the planters always accepted expansion as a matter of course. An agricultural life was developed which was based upon the exploitation of the soil's natural fertility. To the evil of a single crop was added insufficient plowing and shallow cultivation, which, on loose soils and rolling lands and under heavy and concentrated rainfall, invited destructive erosion; a constant replanting of the same crop in the same soils rapidly depleted the available plant food materials and encouraged soil toxicity and the development of harmful soil organisms; and the failure to add organic matter or artificial fertilizers prevented recovery or even the checking of the work of destruction. Expansion was the only escape, and expansion from the small to the large unit and from the older to the newer regions became a normal part of life in the section; and when expansion became difficult, lowering standards of living, hardening of social lines, and conflict between the various agents in the social, economic and political life, developed.

Back of the planters who were practicing such a system, were outside conditions which largely determined their course. Ignorance and habit helped in part to produce and prolong bad practices, but the remarkable advances made in the periods from 1790 to 1815 and from 1830 to the War between the States, indicate a degree of intelligence, energy, and capacity for progress that absolves the individual planter from a major part of the blame for the destructive course pursued. In no section of the nation and in no period of its history were greater agricultural advances made or greater difficulties overcome, than in Virginia and Maryland in these periods. Seemingly the planters improved their methods and conserved their soils when they could do so. When markets opened and profits could be made, the practices of improved agriculture spread rapidly. The blame for so wide-spread destruction cannot be placed upon any inherent careless, shiftless, or easy-going character so often ascribed to the men of the Old South. The causes lay deeper.

Nor does slavery, as distinguished from negro labor, seem to have had much influence. Slavery fitted as well into the improved farming of the later day as it did into the destructive work of the earlier period. If capitalistic agriculture wrought greatest ruin it showed an equal capacity for the work of improvement. It was upon the larger plantations, where capital and a careful division of labor could be practiced, that the most rapid recovery took place and the greatest advances were made.

The destructive practices of the Old South were, in fact, in the beginning merely the normal product of frontier conditions. The dependence upon a single crop produced by whatever methods gave largest immediate returns regardless of the waste entailed; the thrusting of the burdens of abnormal production upon land because it was more plentiful than either capital or labor; the placing of an exaggerated value upon the crop which first furnished the surplus by which exchange with the outside world was established—all these were typical frontier practices which have characterized all frontiers.

And practices begun by the frontier were continued under the influence of markets and government, and the pressure which they added made the continuance of early practices almost compulsory. Their burdens were adjusted to exploitive production and as long as these burdens remained, new methods could not be introduced. The force of government lessened with the Revolution, but the influence of markets continued to a degree that can be appreciated only when the part which more favorable conditions played in the work of recovery is understood. Here, as in most places, markets and profits determined to a large extent the agricultural practices in vogue.

Such an understanding of causes makes the agricultural practices of the Old South but normal developments under the social and physical conditions which surrounded them. It robs the story of any features that belong to the South alone as a section and rising out of its peculiar institutions and characteristics. The story of soil depletion in this region becomes but a normal chapter in the story of the farmer and his lands wherever he may be in time and in place.

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